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Designing public playgrounds for inclusion: Universal Design for Play (UDP), a tailored perspective

Thesis presented by

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for the degree of

Doctor of Philosophy

University College Cork

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2022

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Declaration

This is to certify that the work I am submitting is my own and has not been submitted for another degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified within the contents. I have read and understood the regulations of University College Cork concerning plagiarism and intellectual property.

Signature: Alice Moore Date: 30 August 2022

Alice Moore

List of Abbreviations

ADA:	Americans with Disabilities Act
AOTA:	American Occupational Therapy Association
AOTI:	The Association of Occupational Therapists of Ireland
CABE:	Commission for Architecture and the Built Environment
CAOT:	Canadian Association of Occupational Therapists
CEN:	The European Committee for Standardisation
CENELEC:	The European Committee for Electrotechnical Standardisation
CEUD:	Centre for Excellence in Universal Design
COST:	European Cooperation in Science and Technology
CRC:	Committee on the Rights of the Child
CRPD:	Committee on the Rights of Persons with Disabilities
DECLG:	Department of the Environment, Community and Local Government
DESSA:	Disability Equality Specialist Support Agency
EN:	European Standard
GDPR:	General Data Protection Regulation
GC2:	General Comment No. 2
GC17:	General Comment No. 17
ICF:	International Classification of Function, Disability and Health
I.S.:	Irish Standard
LAPRN:	Local Authority Play and Recreation Network
NDA:	National Disability Authority
NSAI:	National Standards Authority of Ireland
NSW:	New South Wales
PRISMA:	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
ROI:	Republic of Ireland
SREC:	Social Research Ethics Committee
TGD M:	Technical Guidance Document M
UCC:	University College Cork
UD:	Universal Design

UDI:	Universal Design for Instruction
UDL:	Universal Design for Learning
UDP:	Universal Design for Play
UK:	United Kingdom
UN:	United Nations
UNCRC:	United Nations Convention on the Rights of the Child
UNCRPD:	United Nations Convention on the Rights of Persons with Disabilities
US:	United States
USA:	United States of America
WFOT:	World Federation of Occupational Therapists
WHO:	World Health Organisation

Terms and definitions

For this thesis, the following terms and definitions apply.

Accessibility

is a relative concept, implying that accessibility problems should be expressed as a person-environment relationship. In other words, accessibility is the encounter between the person's or group's functional capacity and the design and demands of the physical environment. Accessibility refers to compliance with official norms and standards, thus being mainly objective in nature.[1]

Adult

person aged 18 years and over.

Affordances

refer to the properties of objects and the environment that invite a specific type of use or method of interaction.[2]

Built environment

human-made surrounding that provides the setting for people to participate in meaningful occupations, including physical buildings, open spaces, and their supporting infrastructure (e.g., transport networks).[3] [4]

[1] Iwarsson, S., & Ståhl, A. (2003). Accessibility, usability and universal design—positioning and definition of concepts describing person-environment relationships. *Disability and Rehabilitation, 25*(2), 57-66. https://doi.org/10.1080/dre.25.2.57.66

[2] Gibson, J. J. (1977). The theory of affordances. *Hilldale, USA, 1*(2), 67-82.

[3] Coleman, S. (2017). *Australia state of the environment 2016: Built environment, independent report to the Australian Government Minister for the Environment and Energy*. Australian Government Department of the Environment and Energy, Canberra.

[4] Watchorn, V., Hitch, D., Grant, C., Tucker, R., Aedy, K., Ang, S., & Frawley, P. (2021). An integrated literature review of the current discourse around universal design in the built environment–is occupation the missing link? *Disability and Rehabilitation*, *43*(1), 1-12. https://doi.org/10.1080/09638288.2019.1612471

Child

person aged 0 – 18 years.[5]

Disability

arises from interactions with the surrounding environment that are amenable to design and structural interventions, and not inherently from capability levels, health status, or associated degrees of impairment.[6] Specifically, for this thesis, a human rights-based approach to disability is adopted which includes policies for Universal Design[7] (refer to Chapter One).

Diverse users

individuals with differing abilities and characteristics or accessibility needs.[8]

Diversity

includes all the ways in which people differ, encompassing the different characteristics that make one individual or group different from another.[9]

Global north

general term used to describe nations of the world that are located primarily in the northern hemisphere, that have historically been identified as "the West", "first world", or "minority world". These nations are characterised by a high level of economic and industrial development.[10]

[5] United Nations (UN). 1989. *Convention on the Rights of the Child*. United Nations High Commissioner for Human Rights. https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-11&chapter=4&lang=en

[6] Clarkson, P. J., & Coleman, R. (2015). History of inclusive design in the UK. *Applied Ergonomics, 46*, 235-247. https://doi.org/10.1016/j.apergo.2013.03.002

[7] Mathaison, J. (2011). United Nations Convention on the Rights of Persons with Disabilities. In W. F. E. Preiser & K. H. Smith (Eds.), *Universal design handbook* (2nd ed., pp. 5.1-5.6). McGraw-Hill.

[8] CEN/CENELEC Guide 6:2014. See: https://boss.cen.eu/media/Guides/CEN-CLC/cenclcguide6.pdf

[9] Kapila, M., Hines, E., & Searby, M. (2016). *Why diversity, equity, and inclusion matter*. The Independent Sector.

[10] Graml, G., Meyer-Lee, E., & Peifer, J. S. (2021). Decolonizing global learning and internationalization: A human-scale case study of innovation. In G. Malfatti (Eds.), *People-centered approaches toward the internationalization of higher education* (pp. 133-148). IGI Global.

Global south

general term used to describe nations of the world that are located primarily in the southern hemisphere, that have historically been identified as the "developing world", "third world" or "majority world". These nations are regarded as having a relatively low level of economic and industrial development.[11]

Health

state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.[12]

Inclusion

For this thesis, inclusion is defined in the context of designing for inclusion, and pertinently, designing inclusive playgrounds. Therefore, inclusion is defined as the act of creating environments in which any individual or group can be and feel welcomed, respected, supported, and valued to fully participate. Moreover, inclusive playgrounds are intended to remove physical and social barriers to participation through designs that provide an environment where all children can play together.[13]

Inclusive design

a design approach that aims at considering people's diversity as much as possible. "Inclusive design" and "design for all" concepts are thought to be synonymous with Universal Design because they share a similar objective of appreciating the broad spectrum of human abilities and including as many people as possible. [14]

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[11] Graml, G., Meyer-Lee, E., & Peifer, J. S. (2021). Decolonizing global learning and internationalization: A human-scale case study of innovation. In G. Malfatti (Eds.), *People-centered approaches toward the internationalization of higher education* (pp. 133-148). IGI Global.

[12] World Health Organisation (WHO). (1946). *Constitution of the World Health Organisation*. Author.

[13] Fernelius, C., & Christensen, K. M. (2017). Systematic review of evidence-based practices for inclusive playground design. *Children, Youth and Environments, 27*(3), 78-102. https://doi.org/10.7721/chilyoutenvi.27.3.0078

[14] Heylighen, A., Van der Linden, V., & Van Steenwinkel, I. (2017). Ten questions concerning inclusive design of the built environment. *Building and Environment, 114*, 507-517. https://doi.org/10.1016/j.buildenv.2016.12.008

Non-user

general term used in this doctoral thesis to describe a person who does not use public playgrounds.

Occupation

everyday activities that people do as individuals, in families, and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to want to and are expected to do.[15]

Occupational injustice

is defined as violations of people's occupational rights.[16] Occupational injustice is understood to be an outcome of social policies and other forms of governance that structure how power is exerted to restrict participation in the everyday occupations of populations and individuals.[17] [18]

Occupational justice

is defined as a justice that recognises occupational rights to inclusive participation in everyday occupations for all persons in society, regardless of age, ability, gender, social class, or other differences.[19] Occupational justice is concerned with enabling, mediating, and advocating for environments in which all people's opportunities to engage in occupation are just, health-promoting, and meaningful.[20]

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[15] American Occupational Therapy Association (AOTA). (2020). Occupational therapy practice framework: Domain and process (4th ed.). *The American Journal of Occupational Therapy, 74*(Supplement_2), 7412410010p1–7412410010p87. https://doi.org/10.5014/ajot.2020.74S2001

[16] Hammell, K. W. (2017). Critical reflections on occupational justice: Toward a rights-based approach to occupational opportunities. *Canadian Journal of Occupational Therapy, 84*(1), 47-57. https://doi.org/10.1177/0008417416654501

[17] Nilsson, I., & Townsend, E. (2010) Occupational justice—Bridging theory and practice. *Scandinavian Journal of Occupational Therapy, 17*(1), 57-63. https://doi.org/10.3109/11038120903287182

[18] Townsend, E. (1993). Muriel Driver memorial lecture: Occupational therapy's social vision. *Canadian Journal of Occupational Therapy, 60*(4), 174–84

[19] Nilsson, I., & Townsend, E. (2010). Occupational justice—Bridging theory and practice. *Scandinavian Journal of Occupational Therapy, 17*(1), 57-63. https://doi.org/10.3109/11038120903287182

[20] Hocking, C. (2017). Occupational justice as social justice: The moral claim for inclusion. *Journal of Occupational Science, 24*(1), 29-42. https://doi.org/10.1080/14427591.2017.1294016

Occupational rights

are defined as the right of all people to engage in meaningful occupations that contribute positively to their own wellbeing and the wellbeing of their communities.[21] Occupational rights are secured by identifying and addressing the capabilities,[22] opportunities, and freedom of choice for individuals, communities, and populations to participate in society.[23]

Participation

involvement in a life situation.[24]

Play

a subjective experience characterised as active, freely chosen, process rather than outcome-oriented and intrinsically motivating[25]; otherwise referred to as play occupation or play for the sake of play.[26]

Playground

outdoor environment that has been specifically designed and designated as a place in which children can play.[27]

Playground professional

a person that plans, designs, and/or provides playgrounds.

[21] Hammell, K. W. (2008). Reflections on...well-being and occupational rights. Canadian Journal of Occupational Therapy,75(1),61–64. https://doi.org/10.2182/cjot.07.007
[22] Sen, A. (2003). Development as capability expansion. In S. Fukuda-Parr & A. K. S. Kumar (Eds.), *Readings in human development* (pp. 41-58). Oxford University Press.
[23] World Federation of Occupational Therapists (WFOT). (2019). *Position statement: Occupational therapy and human rights*. https://www.wfot.org/checkout/20827/25957
[24] World Health Organisation (WHO). (2001). *International classification of functioning, disability and health: ICF*. Author.
[25] Bundy, A. (1997). Play and playfulness: What to look for. In L. D. Parham & L. S. Fazio (Eds.), *Play in occupational therapy for children* (pp. 52-66). Mosby.
[26] Lynch, H., & Moore, A. (2016). Play as an occupation in occupational therapy. *British Journal of Occupational Therapy, 79*(9), 519-520. https://doi.org/10.1177/0308022616664540
[27] Woolley, H., & Lowe, A. (2013). Exploring the relationship between design approach and play value of outdoor play spaces. *Landscape Research, 38*(1), 53-74. https://doi.org/10.1080/01426397.2011.640432

Professional expert

general term used to describe a person with extensive knowledge based on research and/or occupation as well as technical expertise in a particular area (public playground planning, design, and/or provision in the case of this thesis).

Public playgrounds

are generally adult-planned and managed outdoor play spaces,[28] that offer structured, free-of-charge, and seemingly safe spaces for children to participate in outdoor play.[29] They are usually located in neighbourhoods or at locations that playground users drive or take public transportation to.[30]

Play space

general term used to describe any space where a child participates in play.

Play value

value of an environment, object, or piece of equipment for play.[31]

[28] Burke, J. (2013). Just for the fun of it: Making playgrounds accessible to all children. *World Leisure Journal, 55*(1), 83-95. https://doi.org/10.1080/04419057.2012.759144

[29] Lundman, R. (2021). Coping with Standards: Integrating art and safety into the design of a creative playground. *Journal of Planning Education and Research*. Advance online publication. https://doi.org/10.1177/0739456X21994650

[30] Daniels, D. M., & Johnson, E. L. (2009). The impact of community-built playgrounds on the community. *Journal of Trauma and Acute Care Surgery, 67*(1), S16-S19. https://doi.org/10.1097/TA.0b013e3181ac1400

[31] Lynch, H., Moore, A., Edwards, C., & Horgan, L. (2019). *Community parks and playgrounds: Intergenerational participation through universal design*. National Disability Authority.

Social participation

is defined by both social-group and individual-engagement perspectives.[32] Representing the social-group perspective, "social participation" is based on four key dimensions: positive social contacts and interactions, acceptance by peers, social relationships and friendships, and perceptions of being accepted.[33] Representing the individual-engagement perspective, participation is based on two key dimensions: attendance (physical presence) and involvement in activities (the subjective investment in activities, which has a social component).[34]

Social justice

is defined as full participation in society and the balancing of benefits and burdens by all citizens, resulting in equitable living and a just ordering of society.[35] Attributes of social justice include: (1) fairness; (2) equity in the distribution of power, resources, and processes that affect the sufficiency of the social determinants of health; (3) just institutions, systems, structures, policies, and processes; (4) equity in human development, rights, and sustainability; and (5) sufficiency of well-being.[36] Social justice addresses important social goals, whether acting in ways that befit an equitable and compassionate world, respecting human dignity, or creating an inclusive society.[37] Additionally, for this thesis, social justice is considered in the context of Universal Design; although initially focused on disability rights, universal design can focus on any civil rights issue because ultimately design for diversity is concerned with social justice for all.[38]

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[32] Smart, E., Edwards, B., Kingsnorth, S., Sheffe, S., Curran, C. J., Pinto, M., Crossman, S., & King, G. (2018). Creating an inclusive leisure space: Strategies used to engage children with and without disabilities in the arts-mediated program Spiral Garden. *Disability and Rehabilitation, 40*(2), 199-207. https://doi.org/10.1080/09638288.2016.1250122

[33] Koster, M., Nakken, H., Pijl, S. J., & Van Houten, E. (2009). Being part of the peer group: A literature study focusing on the social dimension of inclusion in education. *International Journal of Inclusive Education, 13*(2), 117-140.

[34] Imms, C., Adair, B., Keen, D., Ullenhag, A., Rosenbaum, P., & Granlund, M. (2016). 'Participation': a systematic review of language, definitions, and constructs used in intervention research with children with disabilities. *Developmental Medicine & Child Neurology, 58*(1), 29-38.

[35] Buettner-Schmidt, K., & Lobo, M. L. (2012). Social justice: A concept analysis. Journal of advanced nursing, 68(4), 948-958.

[36] Buettner-Schmidt, K., & Lobo, M. L. (2012). Social justice: A concept analysis. Journal of advanced nursing, 68(4), 948-958.

[37] Hocking, C. (2017). Occupational justice as social justice: The moral claim for inclusion. *Journal of Occupational Science, 24*(1), 29-42. https://doi.org/10.1080/14427591.2017.1294016

[38] Steinfeld, E., & Maisel, J. L. (2012). *Universal Design: Creating Inclusive Environments* (p. 40). Wiley & Sons, Inc.

Universal Design

design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design.[39]

Usability

as a concept implies that a person should be able to use, i.e., to move around, be in and use, the environment on equal terms with other citizens. Accessibility is a necessary precondition for usability, implying that information on the person-environment encounter is imperative. However, usability is not only based on compliance with official norms and standards; it is mainly subjective in nature, taking into account user evaluations and subjective expressions of the degree of usability.[40]

User

person who interacts with a system, product, service, or environment.[41]

User expert

general term used to describe a person with extensive knowledge based on experience (public playground 'end users' in the case of this thesis).

Wellbeing

is generally understood to include physical, social, and emotional health.[42]

[39] United Nations (UN). 2006. *Convention on the Rights of Persons with Disabilities*. United Nations High Commissioner for Human Rights. https://www.un.org/development/desa/disabilities/convention-on-the-rights-ofpersons-with-disabilities/article-7-children-with-disabilities.html

[40] Iwarsson, S., & Ståhl, A. (2003). Accessibility, usability and universal design—positioning and definition of concepts describing person-environment relationships. *Disability and Rehabilitation, 25*(2), 57-66. https://doi.org/10.1080/dre.25.2.57.66

[41] EN17161:2019, 3.12

[42] Statham, J., & Chase, E. (2010). *Childhood wellbeing: A brief overview*. Childhood Wellbeing Research Centre

Abstract

To extend knowledge on how to enable outdoor play, social participation, and inclusion in public playgrounds, the overall aim of this thesis is to establish an evidence base for using Universal Design (UD) for public playground design. The scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD from a higher conceptual level as well as an applied level. It includes five studies that employed multiple methods to review published and grey literature as well as explore the perspectives of "professional experts" and "user experts".

Study I included a review of evidence for using UD in public playground design. Specifically, a scoping review of peer reviewed literature was undertaken to identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD as it applies specifically to public playground design. Findings show that although UD is recognised to have the potential to support the design of public playgrounds, the evidence is currently very sparse and identified the gap in knowledge internationally of how UD is understood as a concept.

Study II included a review of the conceptual understanding of UD in public playground design. Indeed, this consisted of a scoping review to determine how UD and related non-discriminatory planning and design concepts are represented in the context of published research exploring public playground design for inclusion. Findings revealed that that the terms UD, inclusive design, accessibility, and usability are all being used to describe non-discriminatory planning and design processes arbitrarily and without regard for higher or lower order concepts, which has potentially led to inconsistency and confusion. Altogether, diverse interpretations of UD were evident; for some UD was understood as a basic concept resulting in accessibility, for others, UD was more holistic in terms of designing for inclusion.

In Study III, scoping review search methods were developed and applied to synthesise findings from a review of international grey literature guidelines for the design of public playgrounds for inclusion and sought to determine the evidence for using UD and play value in public playground design. Findings highlighted that although UD is recognised to have the potential to support the design of public playgrounds, inconsistent design approaches, principles, and recommendations, were communicated among the included guideline documents. However, the core concept of inclusion underpinned all guideline documents, and a tailored application of UD dominated.

Study IV involved survey methods to determine the ways in which UD is understood and implemented, when planning, designing, and/or providing public playgrounds, from the perspectives of a national sample of playground professionals in the Republic of Ireland. The findings show that playground professionals recognise the importance of UD and implement UD in various ways. However, significant barriers to implementing UD included a lack of knowledge and good practice guides for

embedding UD. To counteract these barriers, a variety of opportunities, initiatives and training prospects were identified.

In Study V, a qualitative descriptive study sought to explore the experiences of using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD. Findings emphasised that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. Nevertheless, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion (Chapter Seven).

In conclusion, this doctoral research contributes with an evidence base for using UD for public playground design both at a conceptual and an applied level. It challenges the current UD concept and argues for further conceptual refinement to consolidate the importance and future application of UD for Play (UDP) in the design of public playgrounds that promote outdoor play, social participation, and inclusion. Moving forward the challenge is to promote the universal establishment of inclusive public playgrounds that offer high play value and include all persons in everyday occupations without injustice.

Keywords: play; play occupation; outdoor play; playground; social participation; inclusion; social justice; Universal Design; Universal Design for Play; playground professional; professional expert; user experts; user experience; human rights; Person Environment Occupation model

Dedication

This thesis is dedicated to my mum, Breda. Tasked with rearing four young children with the untimely death of my father, you made enormous personal sacrifices to give my three brothers and I every possible opportunity in life. Through life's ups and downs you instilled in us the virtues of perseverence and commitment, as we conquered the seemingly impossible together. Mum, you mean the world to me; you are my mentor, my teacher, my role model, and importantly, my best friend. For everything you have done, and all that you still do, this thesis stands as a testament to your extraordinary personal sacrifices, unconditional love, and never ending support and encouragement.

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List of Publications

This thesis is based on the following papers, which are referred to in the text by their respective Roman numerals:

I. **Moore, A.**, Lynch, H., & Boyle, B. (2022). Can universal design support outdoor play, social participation, and inclusion in public playgrounds? A scoping review. *Disability and Rehabilitation, 44*(13), 3304-3325. https://doi.org/10.1080/09638288.2020.1858353

II. **Moore, A.**, Boyle, B., & Lynch, H. (2022). Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of universal design. *Disability and Rehabilitation: Assistive Technology*. Advance online publication. https://doi.org/10.1080/17483107.2021.2022788

III. **Moore, A.**, Boyle, B., & Lynch, H. (2022). Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for universal design. *Children's Geographies*. Advance online publication. https://doi.org/10.1080/14733285.2022.2073197

IV. **Moore, A.**, Lynch, H., & Boyle, B. (2022). A national study of playground professionals universal design implementation practices. *Landscape Research*, 47(5), 611-627. https://doi.org/10.1080/01426397.2022.2058478

V. **Moore, A.**, Lynch, H., & Boyle, B. (*In preparation for publication*). Playground usability: A multi-stage qualitative descriptive study exploring the perspectives of playground users.

Additional PhD outputs and related activities are listed in Appendix A.

Thesis Structure

This thesis is structured as follows.

Chapter One serves to provide an overall context for the studies that comprise this thesis. It introduces the development of the research question and identifies why it is an area of concern that needs to be researched. To provide an overview of the rationale that underpins the studies, a selection of international policies relating to children's rights to play and access the physical environments for play are presented, alongside the importance of outdoor play, social participation, and inclusion. Contemporary perspectives on designing public playgrounds for inclusion are reviewed followed by a definition of some key terms that are commonly used to describe the concept. The overarching aim and objectives of this thesis are then presented.

Chapter Two describes the design and implementation of the five studies that comprise this doctoral research. The philosophical and theoretical considerations underlying the choice of design and research method is introduced briefly. Then, the study setting is introduced, followed by a detailed description of the study designs for the studies that comprise this thesis. The participants and criteria for selection for each of the studies is presented, as well as data collection and data analysis methods. Finally, ethical considerations that underpinned the studies are described, as well as measures that were taken to establish validity.

Chapter Three is based upon the PhD candidate's first published manuscript "Can universal design support outdoor play, social participation, and inclusion in public playgrounds? A scoping review" (**Study I, Paper I**), that was published in the Disability and Rehabilitation Journal. The purpose of this scoping review study was to review evidence for using UD in public playground design. The review situates this thesis within international literature by investigating what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of Universal Design (UD). It provides a broad understanding of how UD, and related concepts, have been conceptualised and discussed in the context of studies exploring public playground design for inclusion.

Chapter Four is based upon the PhD candidate's second published manuscript "Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of Universal Design" (**Study II, Paper II**), which was published in the Disability and Rehabilitation: Assistive Technology Journal. The objective of the scoping review study was to review the conceptual understanding of UD in playground design. It determines how UD and related concepts of inclusive design are represented in the context of published research exploring public playground design for inclusion. While UD has been the focus of research pertaining to playground design, for the first time, this review provides an analysis of how UD and related design concepts are represented amongst playground researchers internationally.

Chapter Five is based upon the PhD candidate's third published manuscript "Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for Universal Design" (**Study III, Paper III**), that was published in the Children's Geographies Journal. The aim of this scoping review study was to explore international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles, and design recommendations within these guidelines. Moreover, the review sought to determine the evidence for using UD and play value for public playground design, to bring together an improved understanding and knowledge base for those who plan, design, and/or provide public playgrounds for inclusion.

Chapter Six is based upon the PhD candidate's fourth published manuscript "A national study of playground professionals Universal Design implementation practices" (**Study IV, Paper IV**), which was published in the Landscape Research Journal. The goal of this descriptive cross-sectional survey study in this chapter was to provide a comprehensive "first impression" of the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland and, on this basis, lay the groundwork for future research.

Chapter Seven is based upon the PhD candidate's fifth study "Playground usability: A multi-stage qualitative descriptive study exploring the perspectives of playground users" (**Study V, Paper V**). Previous research identified that when considering a UD

approach for playground design, it is essential to begin with a user's perspective. Therefore, this paper focused on examining social participation of playground users in current playgrounds, to inform good practice in UD. The primary aim of the study presented in this chapter was to explore the experiences of using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD. The secondary aims were to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts, by exploring what an ideal (dream) playground would look like. The study is presented as a draft manuscript that is in preparation for publication.

Chapter Eight presents a project that the PhD candidate was involved with over the course of her PhD studies. Presented as an impact case study, the project in question was a collaborative project, carried out over two years in a voluntary capacity, to support a newly established not-for-profit organisation (Crann Centre) in Cork, Ireland, in their efforts to build a state-of-the-art inclusive play and recreation space. Although not part of the PhD project necessarily, the project was underpinned by the knowledge derived from the studies that comprise this doctoral research. In addition, this project further contributes an emerging evidence base for using UD for the design of play and recreation spaces, and therefore, further addresses the overall aim of this thesis.

Chapter Nine discusses and draws conclusions about the findings from this doctoral research. It summarises the main findings from the five studies that comprise this thesis. It describes the new understandings the data reveals and the contributions that the study may have to the current understandings of using UD for public playground design from a higher conceptual level as well as an applied level. A general discussion on a novel concept that emerged from the findings of the studies that comprise this thesis, that is, UD for Play (UDP), is offered. Further, the strengths and limitations of the overall research design are outlined and followed by a critical analysis of the overall contribution of this doctoral research. Furthermore, implications for research, policy, and practice are identified. Finally, priorities and directions for future research are identified.

Preface

As a way of sharing the values and interests I bring to this enquiry, I want to begin this journey of writing my thesis by sharing my story. My interest in playgrounds stems from my training as an occupational therapist. During my fourth and final year of study, I completed a scoping review study that explored the evidence regarding accessibility and usability of playgrounds for children of all abilities,[43] under the guidance of Dr Helen Lynch in UCC. Findings from this study revealed that despite rights enshrined in international legislations, numerous environmental barriers contribute to making playground environments inaccessible and unusable for many children.[44] Therefore, we concluded that occupational therapists need to assume a more crucial role in the planning, design, and provision of playground environments so that children are enabled to participate in play occupations and specifically advocated for a tiered approach to service provision.[45]

When I qualified as an occupational therapist in 2014, my interest in developing the evidence base for play occupation, and specifically, the development of inclusive play environments, grew stronger. Nevertheless, I was intrigued to learn about the place of play in children's lives. Indeed, the profession of occupational therapy, and discipline of occupational science, is rooted in the belief that participation in occupation is a significant predictor of wellbeing, however, this tenet was not being reflected in wellbeing indicators in the international context. Therefore, it was perhaps unsurprising when I enrolled myself on a master's by research programme whereby, I explored children's conceptualisations of happiness (as a proxy measure of wellbeing) to explore the subjective link between wellbeing and play occupation,[46] under the guidance of Dr Helen Lynch. Findings from this study illustrated the degree and

[43] Moore, A., & Lynch, H. (2015). Accessibility and usability of playground environments for children under 12: A scoping review. *Scandinavian journal of occupational therapy, 22*(5), 331–344. https://doi.org/10.3109/11038128.2015.1049549

[44] Moore, A., & Lynch, H. (2015). Accessibility and usability of playground environments for children under 12: A scoping review. *Scandinavian journal of occupational therapy, 22*(5), 331–344. https://doi.org/10.3109/11038128.2015.1049549

[45] Moore, A., & Lynch, H. (2015). Accessibility and usability of playground environments for children under 12: A scoping review. *Scandinavian journal of occupational therapy, 22*(5), 331–344. https://doi.org/10.3109/11038128.2015.1049549

[46] Moore, A., & Lynch, H. (2018). Understanding a child's conceptualisation of well-being through an exploration of happiness: The centrality of play, people and place. Journal of Occupational Science, 25(1), 124-141. https://doi.org/10.1080/14427591.2017.1377105

complexity with which children (aged 6 to 8 years, living in Ireland) understand the influences on their happiness (wellbeing) to be interrelated, highlighting an expanded view of play as a subjective aspect of childhood that is intrinsically connected to wellbeing and happiness.[47]

I completed my master's degree in 2016 and following this, I was involved in numerous research projects, many of which included the study of play occupation and play environments, alongside Dr. Helen Lynch in UCC. In addition to my professional training, environments are something that has always concerned me at a personal level in terms of how they can enable or constrain participation in occupation. I read a quote from Alexander Den Heijer some time ago that stated "when a flower doesn't bloom, you fix the environment in which it grows, not the flower".[48] Can the same not be said for people? Why change a person when you can change the environment? Are environments not more amenable to change than people? Why are the rights enshrined in international legislation (play rights and environment rights, in particular) not being respected, protected, and fulfilled? Therefore, my professional and personal life experiences led me to a way of viewing the world from a rights and justice perspective.

Thus, my combined research experiences, as well as personal experiences, demonstrated the importance of further scholarship in the domains of play and inclusive design. Thus, to respond to this need, the overall aim of this PhD programme of research is to establish an evidence base for using Universal Design (UD) for public playground design. The threads that have woven through my professional career, and personal experiences to date has led me into justice-oriented work in occupational therapy and occupational science that is rooted in the belief that occupation is a determinant of both individual and population health and wellbeing and, thus is a basic human right.[49] While this has influenced the view of occupation and the related concepts in this thesis, during the writing of this thesis, I have struggled with many challenges.

[47] Moore, A., & Lynch, H. (2018). Understanding a child's conceptualisation of well-being through an exploration of happiness: The centrality of play, people and place. *Journal of Occupational Science, 25*(1), 124-141. https://doi.org/10.1080/14427591.2017.1377105
[48] https://www.goodreads.com/author/quotes/16373075.Alexander_Den_Heijer
[49] Wilcock, A. A. (2006). *An occupational perspective of health*. Slack Incorporated.

For example, how is the UD concept understood and applied in the context of public playgrounds? Is a great deal of faith being put into the ideals of UD and what concepts should I use to describe this complex understanding? How and where does this research fit with occupational therapy and occupational science research? Therefore, in this thesis, I use a human rights-based approach and adopt concepts such as occupational justice and social justice. I also incorporate a person-environment-occupation model that considers play for the sake of play as fundamental to a good childhood and consider how the fit between person and environment maximises the potential occupation of play that can happen in public playgrounds. Thus, this thesis aims to establish an evidence base for using Universal Design (UD) for public playground design to support the development of well-designed public playgrounds that successfully include all persons in everyday occupations without injustice.

Finally, it was essential that I approached this doctoral research with the awareness of my personal and professional values and interests. To minimise the impact of these on this scholarship, I employed "bracketing" as a method to "mitigate the potentially detrimental effects of preconceptions that may taint the research process".[50] Moreover, I engaged in reflexivity across the entire duration of this doctoral research to neutalise the influence of my subjectivity, acknowledge it, explain it, or capitalise on it.[51] Specifically, critical attention was paid to personal, interpersonal, methodological, and contextual factors that influenced this study.[52]

[50] Tufford, L., & Newman, P. (2012). Bracketing in qualitative research. *Qualitative Social Work, 11*(1), 80-96. https://doi.org/10.1177/1473325010368316 [Page 80]
[51] Gentles SJ, Jack SM, Nicholas DB, McKibbon K. 2014. A critical approach to reflexivity in grounded theory. *The Qualitative Report, 19*(44):1–14.
[52] Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2023). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher, 45*(3), 241-251. https://doi.org/10.1080/0142159X.2022.2057287

Chapter One: Introduction

Introduction

This chapter aims to provide an overall context for the studies that comprise this thesis. It introduces the development of the research question for this doctoral research and identifies why it is an area of concern that needs to be researched. To provide an overview of the rationale that underpins the studies, the importance of play and inclusive public playgrounds will be presented. Moreover, contemporary perspectives on designing public playgrounds for inclusion are reviewed followed by a definition of some key terms that are commonly used to describe the concept. Furthermore, a selection of international policies relating to children's rights to play and access the physical environments for play are presented. Finally, a summary of the main messages is provided before the aims of this thesis are presented.

Development of the research question

The motivation for this research originated from the PhD candidate's research experiences exploring children's play occupation and play environments, underpinned by a commitment to developing the evidence base for the design and provision of inclusive play environments. The PhD candidate's research experiences, spanning several years, consistently demonstrated that many children, particularly children with disabilities and their families, experience public playgrounds as sites of spatial and social exclusion because of physical barriers to access and social barriers to participation (e.g., Blake et al., 2018; Kilkelly et al., 2016; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Moore & Lynch, 2015).

Still, the right to play and access the physical environments (including play environments) is enshrined in the UN Convention on the Rights of the Child (UNCRC) (United Nations [UN], 1989) and further endorsed in the UN Convention on the Rights of Persons with Disabilities (UNCRPD) (UN, 2006). Most State parties across the world, including Ireland, have ratified these Conventions, and thus, have committed to upholding these rights. However, problems in implementing these rights led to the publications of General Comment No. 17 (GC17) on play and leisure (Committee on the Rights of the Child [CRC], 2013) and General Comment No. 2 (GC2) on

accessibility (Committee on the Rights of Persons with Disabilities [CRPD], 2014) to clarify duties of State parties (i.e., the obligations of State parties to ensure the full realisation of all human rights under the Conventions) with respect to human rights treaty provisions. Both General Comments endorse Universal Design (UD) at a conceptual or theoretical level for designing environments that are accessible, usable, and inclusive of all.

More recently, the new European Standard EN 17210:2021 *Accessibility and usability of the built environment – Functional requirements* in conjunction with its companion standard S.R. CEN/TR 17621 *Accessibility and usability of the built environment – Technical performance criteria and specifications* endorses UD for public playground design. Also in Ireland, the context in which this study was undertaken, the I.S. EN 17210:2021&LC:2021 is the adopted Irish version of the European Standard EN 17210 (National Standards Authority of Ireland (NSAI), 2021). Moreover, new draft legislation currently before the Irish Government – *Community Participation (Disability) (Miscellaneous Provisions) Bill* (2019) – specifically requires local authorities to build inclusive public playgrounds. Specifically, the Bill promotes the concept of UD as a way of exceeding minimum accessibility standards, as laid out in the current Building Regulations in Part M and the associated Technical Guidance Document (TGD) M (Department of the Environment, Community and Local Government [DECLG], 2010), to address barriers faced by persons with disabilities in community environments and improve Ireland's inclusiveness.

Subsequently, play researchers internationally have promoted the use of UD, primarily at a conceptual or theoretical level, for developing and providing public playgrounds that support outdoor play, social participation, and inclusion. However, no work had yet been done to synthesis evidence for UD or analyse its use in more detail for public playground design. Consequently, it is challenging to build a comprehensive model for applying UD to playgrounds due to the current lack of evidence to inform best practice. However, within the study of interdisciplinary study of play, there is a strong commitment to the study of play environments to enhance evidence-based practice for participation and inclusion.

Thus, the overarching aim of this thesis was to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level. Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD and includes five studies that employed multiple methods to review published and grey literature as well as explore the perspectives of "professional experts" and "user experts". The PhD candidate received an Irish Research Council Postgraduate Scholarship for the completion of this doctoral research under Grant GOIPG/2019/3861.The subsequent sections offer further information on the essential concepts to this research.

Play

Play is a primary occupation of childhood in many contexts around the world. Although there are many cultural variations and differing attitudes towards play, all children play (Moore & Lynch, 2018a; Roopnarine, 2011). Further, children's universal right to play is formalised in Article 31of the UN Convention on the Rights of the Child (UN, 1989). Yet despite this formal recognition, there is currently no formal consensus on a definition of play (Nijhof et al., 2018). Indeed, Mary Reilly, an influential occupational therapist and occupational scientist, compared the task of defining play to "defining a cobweb" and asserted "only the naïve could believe from reviewing the evidence of the literature that play is a behaviour having an identifiable nature. While common sense may confidently assert that there is such a thing as play, the literature assumes a rather weak position about what the phenomenon is" (Reilly, 1974, p. 113). Smith and Vollstedt (1985) similarly suggested that "the definition of play … is in a muddle" (p. 38). Moreover, Gordon Burghardt (2005) stated that the challenges with defining play are "legendary" (p. 49).

Despite the challenges, many authors from diverse disciplines have attempted to define the word "play" from diverse developmental and sociocultural perspectives. Buhler (1935) was an early author who defined play as an activity with or without materials in which bodily movement is an end in itself. Huizinga (1950) defined play as an activity occurring for its own sake; his definition stated that play was fully absorbing, provided elements of uncertainty, illusion, or exaggeration, and was disconnected from material interest, or profit, proceeding according to rules. Aaron

and Winawer (1965) described play as a continually creative process. Eible-Eibesfeldt (1970) defined play as scientific research conducted by children. Fagen (1984) defined play as "performance … of active behavioural interactions that enable the player to adjust to and create its own environment, both ecological and social" (p. 169). Garvey (1990) defined play as voluntary, intrinsically motivated activities, associated with recreational pleasure and enjoyment. Noschis (1992) described play as "an imitation of adult's activities bringing children closer to the adult world" (p. 2). Sutton-Smith (1997) defined play as novel adaptation like the evolutionary struggle for survival and discussed the seven rhetoric's of play in the *Ambiguity of Play*. Bruner (1997) described play as "an approach to action not a form of activity (p. v).

Burghardt (2005) defined play as seemingly non-functional and repeated behaviour, initiated in a relaxed, low-stress setting. Eberle (2014) defined play as "an ancient, voluntary, 'emergent' process driven by pleasure that yet strengthens our muscles, instructs our social skills, tempers and deepens our positive emotions, and enables a state of balance that leaves us poised to play some more" (p. 231). The LEGO Foundation (2017) defined play as activities that promote agency, can be free or structured, and is experienced as joyful, meaningful, active, engaged, iterative thinking, and social. Wright (2018) defined play as existing within a safe, bounded reality defined by the absence of coercion, an imaginative method for engaging the real, and one of the ways to learn boundaries between fantasies and realities. Wright (2018) further stated that play "might be purposeful and productive or purposeless and non-productive, but never meaningless" (p. 23). Some have concluded that the definitions of play may serve a variety of purposes (Bennett et al., 1997), while others have argued that no single definition is necessary because play is so complex (Taylor et al., 2001; Pellegrini & Smith, 1998). Others have argued that without a definition, the impact, credibility, and comparability of some research is lost (Cattanach, 1998). Nonetheless, and despite these numerous attempts to define the term "play", Kuhaneck and O'Brien (2023) asserted that "none of these definitions have gained the consensus to become 'the' definition of play" (p. 2).

Notwithstanding the challenges, as an aid to understanding the phenomenon of play, over the past two centuries play theorists put forward play theories as an aid to

understanding the phenomenon of play (Nijhof et al., 2018; Stagnitti, 2004). Play theories are divided into classical and modern theories of play (Mellou, 1994; Saracho, 2017). Classical play theories (*surplus energy theory, recreation or relaxation theory, pre-exercise theory, and recapitulation theory*) surfaced in the nineteenth century and attempted to explain the existence and purpose of play (Mellou, 1994). Classical theories were developed often by means of opinion or observation of children and most of these theories suggested some future benefit in relation to survival (Kuhaneck & O'Brien, 2023). Modern play theories (*arousal modulation theories, psychodynamic theories, cognitive development theories, play as socialisation, and metacommunicative theory*) emerged after 1920 and tried to explain the role of play in child development (Mellou, 1994). Therefore, the concept of play has varied widely over the past two centuries, and consequently the plethora of descriptions and interpretations of play behaviour has made defining play difficult (Stagnitti, 2004).

Even so, authors have created lists of characteristics that come together to make an activity play (Kuhaneck & O'Brien, 2023). These characteristics include intrinsic motivation, suspension of reality, internal locus of control, and being spontaneous, fun, flexible, totally absorbing, vitalising, and end in and of itself, non-literal, and challenging (Bracegirdle, 1992; Bundy, 1997; Ellis, 1973; Goodman, 1994; Huizinga, 1950; Levy, 1978; Neumann, 1971; Reilly, 1974; Stewart et al., 1991; Sutton-Smith, 1997). Moreover, when children are asked about play, they highlight the importance of fun, pleasure, choice, and freedom (Alexander et al., 2012; Glenn et al., 2013; Moore & Lynch, 2018a); if these qualities are absent, children no longer consider it play (Glenn et al., 2013). Nonetheless, it is important to acknowledge that not all play is wonderful; play may be scary, cruel, dangerous, risky, sexualised and not completely free (Kuhaneck & O'Brien, 2023). Moreover, play is not always flexible because of rules and structure, it can be about struggles for power and dominance, and it may not always be accessible and available for all (Kuhaneck & O'Brien, 2023).

Aside from the characteristics, other authors have defined play by comparing it to its opposite (Kuhaneck & O'Brien, 2023). In recent years, two dichotomies have prevailed – the play vs. non play dichotomy (Neale et al., 2018) and the play vs. work dichotomy (Wright, 2018). However, Kuhaneck and O'Brien (2023) recently asserted

that such dichotomies require further examination, as dichotomies are not universal in cross-cultural contexts and do not necessarily account for societal changes. To manage these challenges, authors have proposed various ways to define play; play is defined as a continuum or a spectrum based on the level child-directed or adult-directed play (Ray-Kaeser & Lynch, 2017; Zosh et al., 2018), as an attitude (playfulness) (Bundy, 1997; Ferland, 2005; Skard & Bundy, 2008), as experience (Henricks, 2015), and as a process (Eberle, 2014).

Considering these definitions and ways of describing play, for this thesis, a definition that is similar and different to others is adopted to encompass the range of play of children (Kuhaneck et al., 2010). Borrowed from Kuhaneck and colleagues (2010), play is defined as "any activity freely entered into that is fun or enjoyable and that is appropriately matched to one's skill to represent an attainable challenge" (p. 6). The definition includes three important facets: the idea of play as freely entered into reflects understandings in the literature on the importance of intrinsic motivation for play; fun and enjoyment is intended to give voice to the importance and meaning of play as described by children themselves; and the just right challenge suggests that tasks must not be too hard or too easy (Kuhaneck et al., 2010; Kuhaneck & Spitzer, 2023). Also, because the PhD candidate is an occupational therapist and scientist it is important to acknowledge that the profession of occupational therapy and academic discipline of occupational science, provides a unique perspective on play as an occupation (Bundy, 1992; Bundy, 1993; Couch et al., 1998; Knox, 1997; Parham, 1996; Wood, 1996); this will be described in more detail next.

Play as an occupation

Following Reilly's work, renewed interest in play resulted in the publication of the first comprehensive textbooks on play in occupational therapy during the 1990s (Giles & Chandler, 1997; Parham & Fazio, 1996). During this time ideas about play began to change as well (Kuhaneck, 2023). Influenced by occupational science, scholars promoted the idea of viewing play and leisure as an explicit goal of occupational therapy intervention (Bundy, 1993; Parham, 1996), and described play as an integral part of the human experience (Parham, 1996). Consequently, throughout the 1990s occupational therapy and occupational science literature stressed the importance of

considering play as an occupation (Bundy, 1992; Bundy, 1993; Couch et al., 1998; Knox, 1997; Parham, 1996; Wood, 1996). Since then, occupational therapy and occupational science literature has continued to stress the importance of considering play as an occupation (e.g., Kuhaneck et al., 2010; Kuhaneck & Spitzer, 2023; Lynch & Moore, 2016; Lynch, Prellwitz, et al., 2018; Miller Kuhaneck et al., 2013; Moore & Lynch, 2018a, 2018b). Before further discussion on the distinct use of play in occupational therapy, this section will explore more specifically play as occupation. Some issues arising firstly include determining what is meant by "occupation" before considering play as an occupation.

Occupational therapy is defined as "the therapeutic use of everyday life occupations with persons, groups, or populations (i.e., the client) for the purpose of enhancing or enabling participation" (American Occupational Therapy Association [AOTA], 2020, p. 1). The profession of occupational therapy has had much difficulty in defining occupation over the years (Kuhaneck & O'Brien, 2023); however, many have attempted to define the word "occupation". Clark and colleagues (1991) defined occupation as "simply … chunks of culturally and personally meaningful activity in which humans engage that can be named in the lexicon of our culture" (p. 301). Later, Law and colleagues (1997) defined occupation as "activities of everyday life, named, organised, and given value and meaning by individuals and culture. Occupation is everything people do to occupy themselves, including looking after themselves … enjoying life … and contributing to the social and economic fabric of their communities" (p. 32). More recently, the fourth edition of the Occupational Therapy Practice Framework (OTPF-4) produced by the American Occupational Therapy Association ([AOTA], 2020) adopted the definition set forth by the World Federation of Occupational Therapists (WFOT). Occupations are defined as "the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to, and are expected to do" (WFOT, 2012, para. 2).

Nonetheless, and despite these numerous attempts to define the term "occupation", there has been lengthy debate in occupational therapy and occupational science literature regarding the use of the word's "occupation" and "activity" and changes in

their use over time (e.g., Bauerschmidt & Nelson, 2011; Hinojosa & Blount, 2004; Nelson, 1996; Pierce, 2001). Consequently, the OTPF-4 (AOTA, 2020) differentiates these terms. Specifically, the OTPF-4 states that the term occupation "denotes personalized and meaningful engagement in daily life events by a specific client", whereas the term activity "denotes a form of action that is objective and not related to a specific client's engagement or context" (AOTA, 2020, p. 7). To put it simply, Kuhaneck (2023) confirmed that occupations are meaningful to a particular person, while activities are objective actions not specific to a person or a context.

Moreover, Clark and colleagues (1991) suggested that occupations have **form, function,** and **meaning** and occur in sociocultural and historical **contexts**. In terms of play, the **form** includes specific play activities that are commonly accepted and named (Kuhaneck et al., 2010; Kuhaneck, 2023). For the forms of play, many authors refer to types or categories of play (e.g., Barton, 2010; Belsky & Most, 1981; Eckert et al., 2020; Hughes, 2006; Parten, 1932; Pellegrini, 1988, 2006; Pellegrini & Bjorklund, 2004; Piaget, 1962; Sandseter, 2009a, 2009b; Smilansky, 1968; Ungerer & Sigman, 1981; Whitebread et al., 2017). Moreover, attention has been directed toward the play of children with disabilities in recent years. Indeed, researchers have acknowledged that while children with disabilities do play and have similar playful attitudes to their peers without disabilities, they play differently (e.g., Angelin et al., 2018; Barton, 2015; Wolfberg et al., 2015). Specifically, researchers concluded that depending on the type and severity of disability present, children may progress through similar stages of play development to peers without disabilities but at delayed ages and reduced rates (Besio et al., 2017).

The **function** of play includes consideration of play's primary purpose as well as its beneficial consequences (Kuhaneck & O'Brien, 2023). The function of play may be to promote flexibility, problem solving, and adaptation to novel situations in the environment (e.g., Bateson, 2005; Kuhaneck et al., 2010; Kuhaneck, 2023; Sutton-Smith, 1997). While the instrumental approach to play (observing play as a mechanism for learning and healthy development) has dominated discussions in recent years as researchers have attempted to appropriate play for instrumental purposes (e.g., Ginsburg et al., 2007; Gleave & Cole-Hamilton, 2012; Milteer et al., 2012; Powell,

2009; Whitebread et al., 2012), occupational therapists and occupational scientists also value play in terms of how it can make life joyful for a child and enhance wellbeing (Kuhaneck et al., 2010; Kuhaneck, 2023; Moore & Lynch, 2018a). Moreover, Article 31 of the UNCRC (UN, 1989) values and protects children's play independently of its social and developmental imperatives (Lester & Russell, 2010), therefore, equally important is the need to value play as important for its own sake. Thus, for this thesis play is defined as an occupation, that is play undertaken for its own sake (CRC, 2013; Lynch & Moore, 2016).

The subjective **meaning** of play for an individual is regarded as one of the most important considerations of play as an occupation (Hammell, 2004; Kuhaneck, 2023). Indeed, occupational therapy and occupational science researchers have conducted several qualitative and survey studies whereby they asked children and adolescents about what play means to them (e.g., Caiazzo et al., 2008; Heah et al., 2007; Miller & Kuhaneck, 2008; Moore & Lynch, 2018a; Pollock et al., 1997; Skär, 2002; Tamm & Skär, 2000). By and large, children and adolescents responded that they choose to play because it is fun. Moreover, when asked about what play means to them, or to describe its place in their lives, children in the United Kingdom (UK) reported that it is enjoyable (Brockman et al., 2011), children in the United States of America (USA) described it as fun (Miller & Kuhaneck, 2008), while children in Greece stated that it gives them a sense of belonging (Prompona et al., 2020). Additionally, children in Ireland and China reported that play makes them happy (Moore & Lynch, 2018a; Yan et al., 2005), while children in Canada identified that play is more about the process than the outcome (Glenn et al., 2013).

For children with disabilities, similar meanings were identified. Specifically, Graham and colleagaues (2018) conducted a systematic thematic synthesis of qualitative studies that explored the meaning of play for children and young people with physical disabilities. For the thirteen studies that met the inclusion criteria, children in those studies described play as something that is enjoyable, fun, and makes them feel positive (Graham et al., 2018). Moreover, adolescents with physical disabilities in Canada described play as something that is self-controlled and related to a lack of stress or worry (Pollock et al., 1997). Even so, play is not always associated with fun

and happiness (Lynch, 2023). For example, children with disabilities in Sweden valued playgrounds as a special place for play, however, they reported feeling afraid to try playground equipment if other children were there due to the fear of being teased (Prellwitz & Skär, 2007). Moreover, the systematic thematic synthesis conducted by Graham and colleagues (2018) found that children and young people with physical disabilities reported frustration with play experiences due to exclusion from peers, and often felt that no one wanted to play with them. Additionally, children in Canada also reported on what was not play; while some children identified watching television as boring, others included this as a play activity when it was related to a play event (Glenn et al., 2013). Still, play occupation is meaningful to children; however, the meanings children attribute to play are varied. Indeed, Kuhaneck (2023) asserted that "the meaning attributed to play may be as varied and unique as the individual players" (p. 58).

In addition to form, function, and meaning, and aligning with the proposal set forth by Clark and colleagues (1991) to consider context also, contemporary occupational therapy models have emphasised the importance of examining the **contexts** in which occupations occur (Kuhaneck et al., 2010). Consequently, occupational therapy practitioners have increasingly documented the importance of contextual features that influence children's play (Kuhaneck & Spitzer, 2023). Specifically, Skard and Bundy (2008) developed an assessment tool to examine the environmental supportiveness for playfulness and the fit between the player and the play environment. Environmental features that are reported to support play and playfulness include physical safety, space for play, time for play, availability of developmentally appropriate and preferred play materials, and appropriate social interaction with either peers or adults (Kuhaneck et al., 2010; Kuhaneck & Spitzer, 2023). In an examination of the playground as a natural environment, Lynch, Moore, and colleagues (2018) documented that good play spaces need to be designed to provide good quality play experiences as well as provide affordances for varied forms of free play that incorporate challenge, stimulation, personal preferences, and fun.

Notwithstanding the developments, and consideration of play in terms of form, function, meaning, and context, the place of play in paediatric occupational therapy

play research and intervention has changed over the years (Case-Smith, 2013; Stagnitti, 2004); this is presented next.

Play and occupational therapy

Traditionally play was a highly visible aspect of occupational therapy. During the founding years of the profession, major contributors from the USA were some of the most influential internationally. Indeed, Adolf Meyer named play as one of the 'Big Four' factors that a person should balance for maintenance of health, along with work, rest, and sleep (Meyer, 1922). Also, Eleanor Clarke Slagle, a major contributor to the early thinking about the role of occupation in promoting and maintaining everyday performance, identified how play was essential for living (Reed, 2019; Slagle, 1922).

However, a paradigm shift occurred in the 1940s in the USA, whereby the profession diverged from a holistic occupation-based approach and became aligned with a biomedical model of practice (Jackson, 1998). Consequently, play was thought to be unscientific and inappropriate for use in practice, and greater emphasis was bestowed upon more "scientific" measurable approaches like measuring motor skills and adapting equipment (Rodger & Ziviani, 1999). Nonetheless, during the 1960s and 1970s, before the emergence of the new academic discipline of occupational science, Mary Reilly had a critical role in reminding the field to return to its focus on occupation, which formed the development of the occupational behaviour frame of reference (Parham & Primeau, 1997; Reilly, 1963, 1974; Rodger & Ziviani, 1999). Inspired by the arousal modulation theories, Reilly's occupational behaviour frame of reference recognised the importance of play for the development of skills needed in adulthood, and in the human struggle for mastery, achievement, and adaptation (Parham & Primeau, 1997; Reilly, 1974).

Since the work of Reilly, Florey (1981), Bundy (1993), and Parham (1996) recommended that the occupational therapy profession embrace play as a legitimate practice area and validate its importance through research. Subsequently, the AOTA acknowledged the importance of play in its Societal Statement on Play (Primeau, 2008):

> Occupational therapy practitioners support, enhance, and defend children's right to play as individuals and as members of their families, peer groups, and communities by promoting recognition of play's crucial role in children's development, health, and well-being; establishing and restoring children's skills needed to engage in play; adapting play materials, objects, and environments to facilitate optimal play experiences; and advocating for safe, inclusive play environments that are accessible to all.

Following direction from Primeau (2008), occupational therapists have more carefully considered their practices in relation to play (Kuhaneck, 2023), which has resulted in the promotion of new practices (Kuhaneck et al., 2010; Kuhaneck & Spitzer, 2023) as well as new models and ideas about the way in which play is used in therapy (Ray-Kaeser & Lynch, 2017). For example, Bundy (2011) identified five facets of play that have importance in occupational therapy: the child's skills and abilities to play, the attitude or approach to play (playfulness), the activities of play, the environmental support for play, and the motivation for play. Moreover, Ray-Kaeser and Lynch (2017) consider the continuum from work to play in occupational therapy sessions, considering the amount of intrinsic to extrinsic motivation, and adult direction to child direction. Moreover, scholars in the field have infused the literature with academic articles, textbooks, and assessment tools for addressing play in the lives of children (Table 1).

Table 1: Academic articles, textbooks/ chapters, and assessment tools for addressing play in the lives of children

	Examples
Academic articles	(Askins et al., 2013; Blake et al., 2018; Bodison, 2015; Buchhorn & Lynch, 2010; Bundy et al., 2017; Bundy et al., 2008; Case-Smith & Kuhaneck, 2008; Cordier et al., 2009; Cornell et al., 2018; Dadson et al., 2020; Davidson & Stagnitti, 2021; Dender & Stagnitti, 2011; Dender & Stagnitti, 2015; Dionne & Martini, 2011; Fabrizi & Hubbell, 2017; Fabrizi, 2015; Fabrizi et al., 2016; Fahy et al., 2021; Gokhale et al., 2014; Graham et al., 2015; Henning et al., 2016;

	Jankovich et al., 2008; Kennedy-Behr et al., 2013; Kent et al., 2018; Kuhaneck et al., 2020; Kuhaneck & Britner, 2013; Laverdure & Beisbier, 2021; Lynch & Moore, 2016; Lynch et al., 2020; Lynch, Moore, et al., 2018; Lynch, Prellwitz, et al., 2018; McDonald & Vigen, 2012; Miller & Kuhaneck, 2008; Miller Kuhaneck et al., 2013; Miller et al., 2017; Mitchell et al., 2018; Mohammadi et al., 2017; Moore & Lynch, 2015, 2018a, 2018b; Nestor & Moser, 2018; Nordström et al., 2020; Novak & Honan, 2019; O'Connor & Stagnitti, 2011; Pacciulio et al., 2010; Pfeifer, Pacciulio, et al., 2011; Pfeifer, Queiroz, et al., 2011; Pfeifer, Terra, et al., 2011; Prellwitz & Skär, 2007; Ríos-Rincón et al., 2016; Ripat & Becker, 2012; Roberts et al., 2018; Rodger & Ziviani, 1999; Román-Oyola et al., 2018; Romli & Wan Yunus, 2020; Schneider & Rosenblum, 2014; Sposito et al., 2019; Stagnitti et al., 2012; Tanta & Kuhaneck, 2020; Thorne et al., 2021; Uren & Stagnitti, 2009; Wadley & Stagnitti, 2020; Waldman-Levi & Bundy, 2016; Waldman-Levi et al., 2019; Watts et al., 2014; Welters-Davis & Mische Lawson, 2011; Wilkes-Gillan et al., 2016; Wilkes-Gillan et al., 2014; Wilkes et al., 2011; Wyver et al., 2010)
Textbooks/ Chapters	(Barron et al., 2017; Bianquin et al., 2018; Brady et al., 2012; Bundy, 2011; Burton & Kuhaneck, 2023; Case-Smith & O'Brien, 2010, 2015; Cunningham & Kuhaneck, 2023; Fabrizi, 2023; Halperin & McCloskey, 2023; Kuhaneck et al., 2010; Kuhaneck & Spitzer, 2023; Kuhaneck, 2023; Kuhaneck & Cunningham, 2023; Kuhaneck & Metz, 2023; Kuhaneck & O'Brien, 2023; Lane & Bundy, 2012; Law et al., 2017; Lynch, 2023; O'Brien & Kuhaneck, 2020; Parham & Fazio, 2008; Parson et al., 2020; Prellwitz & Lynch, 2018; Ray-Kaeser et al., 2018; Ray-Kaeser & Lynch, 2017; Rodger & Kennedy-Behr, 2017; Spitzer, 2023a; Spitzer, 2023b, 2023c Spitzer et al., 2023; Stagnitti, 2010, 2014; Stagnitti & Cooper, 2009; Stagnitti, 2023; Waldman-Levi, 2023)

Assessment tools/ Translation of assessment tools	(Almasri et al., 2019; Bedell, 2011; Bourke-Taylor et al., 2009; Bryze, 2008; Henry, 2008; Huang et al., 2009; Hui & Dimitropoulou, 2020; Knox, 2008; Lautamo & Laaksonen, 2019; Linder & Linas, 2009; McDonald & Vigen, 2012; Pacciulio et al., 2010; Rosenblum et al., 2010; Schneider & Rosenblum, 2014; Schreuer et al., 2014; Skard & Bundy, 2008; Sposito et al., 2019; Stagnitti, 2017, 2018, 2019; Ullenhag et al., 2012; Waldman-Levi & Bundy, 2016)

However, despite the profession's promotion of our role in play, and the assertion that play is a primary occupation of childhood (Bundy, 1992; Parham & Fazio, 1996; Prellwitz, 2007), occupational therapy practice has not consistently reflected this tenet (Couch et al., 1998; Lynch, Prellwitz, et al., 2018; Miller Kuhaneck et al., 2013; Moore & Lynch, 2018a). Indeed, researchers in the USA, Ireland, Sweden, and Switzerland, found that play is rarely the focus of goals or outcomes of paediatric occupational therapy intervention and instead, increasing children's skills has primarily been the objective of occupational therapy play research and clinical intervention (Couch et al., 1998; Lynch, Prellwitz, et al., 2018; Miller Kuhaneck et al., 2013; Moore & Lynch, 2018a). Collectively, the authors concluded that the profession has work to do to realise its potential in the realm of play (Kuhaneck, 2023).

Still, the importance of occupation-based paediatric practice has been stressed in professional documents; some of these documents include the OTPF-4 (AOTA, 2020), the profession's philosophical base (AOTA, 2017), and practice guidelines (Cahill & Beisbier, 2020; Clark & Kingsley, 2020). Consequently, while changing the child's body functions and structures (child-focused) has traditionally been the objective of occupational therapy play research and clinical intervention, emerging therapy interventions targeting changes in the tasks and environments (context-focused) are showing promise as effective ways to address participation (e.g., Anaby et al., 2015; Darrah et al., 2011; Law et al., 2011; Pollock et al., 2014). This shift most likely reflects the profound change that has occurred in recent years in the understanding of disability, from a medical model towards a human rights-based approach (Lid, 2014), otherwise referred to by rehabilitation scholars as a paradigm shift (Bickenbach, 2012; Lid, 2014; Reinhardt, 2011).

Subsequently, occupational therapy and occupational science scholars have begun to focus their attention on the impact of the environment including different aspects of environmental design, of the built environment, and of policy and sociocultural environments, for example. Indeed, such a focus in the impact of the environment on children's ability to participate in outdoor play, has broadened the scope of research and intervention (Bundy et al., 2017; Bundy et al., 2011; Bundy et al., 2015; Engelen et al., 2013; Engelen et al., 2018; Snow et al., 2019; Sterman et al., 2016; Sterman et al., 2020; Wyver et al., 2014). For example, researchers have explored user perspectives (Lynch et al., 2020; Prellwitz, 2007; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Sterman et al., 2019; Wenger et al., 2021), investigated the perspectives of municipality representatives (Lynch et al., 2019, 2020; Prellwitz & Tamm, 1999; Prellwitz et al., 2001; Sterman et al., 2019), reviewed policy documents (Lynch, Moore, et al., 2018), analysed guidelines (Lynch et al., 2019; Lynch, Moore, et al., 2018), studied research evidence (Moore & Lynch, 2015; Prellwitz & Lynch, 2018), developed tools to assess playground design (Lynch et al., 2019), and evaluated playground design (Lynch et al., 2019; Perry et al., 2018).

Despite these advancements, scholars are continuing to call upon occupational therapists and occupational scientists to address children's play rights and take seriously the need to increase their understanding of how environments, particularly public playgrounds, support or prevent participation in play occupation and contribute to the occupational justice agenda of creating the context for the realisation of Article 31 (Lynch et al., 2020; Moore & Lynch, 2015; Sterman et al., 2016). While many occupational therapists work with individuals and families to modify home and other environments within the context of healthcare services (Larkin et al., 2015), Parnell and Wilding (2010) asserted that the profession needs to look beyond these conventional practices as "occupational therapists have something unique and important to offer those who plan and develop our shared built environments" (p. 345). They identified that occupational therapists must address more contemporary social and political issues to advocate for occupational justice and inclusion for all (Parnell & Wilding, 2010). Therefore, to address these research needs and gaps, this thesis focuses on how to better support occupational participation (i.e., participation in play occupation) through the design of shared built environments (i.e., public playgrounds).

In doing so, the research contributes to the growing knowledge base on the relationship between the design of the built environment and people's health, social participation, and attainment of human rights.

Participation in play occupation

The right to participation underpins the UNCRC (UN, 1989) and the UNCRPD (UN, 2006). Moreover, in 2001, the concept of participation was included in the World Health Organisation (WHO) International Classification of Function, Disability and Health (ICF) (WHO, 2001) to better understand the lived experience of people with disabilities (Larsson-Lund & Nyman, 2017). Specifically, the ICF called upon health professionals to redress the uneven attention to body and extend their focus of concern to the activity and participation in the environment. Participation is defined in the ICF as "involvement in a life situation" and restrictions in participation "are problems an individual may experience in involvement in life situations" (WHO, 2001, p. 14). In its footnotes, the ICF confirmed that involvement includes taking part, being included or engaged, being accepted, or having access to needed resources (WFOT, 2001, p. 15).

Consequently, participation became a significant concept in occupational therapy practice and research (Larsson-Lund & Nyman, 2017), and the WFOT has consistently highlighted the significance of participation in Occupational Therapy. For example, in 2006, the WFOT declared the imperative of ensuring "equitable access to participation in occupation, regardless of difference (WFOT, 2006, p.1). Later, in 2010, the WFOT asserted that "the primary goal of occupational therapy is people's participation in occupation" (WFOT, 2010, p. 1). Moreover, in 2014, the WFOT declared that "all persons … by virtue of being human, have the right to occupational opportunities necessary to meet human needs, access human rights, and maintain health. This right is not conditional" (WFOT, 2014, p. 1). Furthermore, in 2019, to reflect occupational therapy's primary concern with people's participation in occupation (WFOT, 2010), the WFOT declared that "occupational therapists around the world are obligated to promote occupational rights as the actualisation of human rights" (WFOT, 2019, p.1).

Even so, the Occupational Therapy profession has a theoretical foundation and history that focuses on the social participation of people in society to promote justice and transformation of the social environment (Law, 1991; Townsend, 1993). Specifically, the term 'occupational justice', originating in the field of occupational science, emerged in the late 1990's and has been discussed by numerous occupational therapists and scientists over the years, which has resulted in discourses on its historical roots (Serrata Malfitano et al., 2016), moral underpinnings (Hocking, 2017), theoretical approach (Hammell, 2017; Olivares-Aising, 2018), as well as practice implications (Benjamin-Thomas & Rudman, 2018; Durocher et al., 2014; Gupta, 2016; Malfitano et al., 2019), for example.

Typically framed as an aspect of social justice (Hocking, 2017), numerous attempts have been made to define the term occupational justice (e.g., Wilcock, 1998; Wilcock & Townsend, 2000; Nilsson & Townsend, 2010; Stadnyk et al., 2010; Wilcock & Hocking, 2015). For this thesis, occupational justice is defined as a justice that recognises occupational rights to inclusive participation in everyday occupations for all persons in society, regardless of age, ability, gender, social class, or other differences (Nilsson & Townsend, 2010). Leveraging on the ideas of social justice, Hocking (2017) confirmed that "breaches of occupational justice occur when participation in health enhancing occupations is inequitable across different groups in society, with some people unfairly benefiting and others subjected to patterns of occupation that are detrimental to health and wellbeing" (p. 33).

Later, in a critique of the conceptual difficulties with existing variants of occupational injustice, Hammell (2020) reasserted that "a violation of occupational rights, due to unfair and inequitable social conditions, constitutes an occupational injustice" (p. 382). Furthermore, The WFOT Revised Position Statement on Occupational Therapy and Human Rights (WFOT, 2019) declared that "occupational justice requires occupational rights for all" and articulated that occupational justice "is the fulfilment of the right for all people to engage in the occupations they need to survive, define as meaningful, and that contribute positively to their own wellbeing and the wellbeing of their communities".

Moreover, Hocking (2017) declared that occupational justice is "concerned with enabling, mediating, and advocating for environments in which all people's opportunities to engage in occupation are just, health-promoting, and meaningful" (p. 33). Additionally, Hammell (2020) identified that "a broad focus on occupational injustice and its manifestations (e.g., social exclusion, discriminatory and inequitable access to resources and opportunities) would enable a focus on the larger structural issues of social injustices and their impact both on individuals and collectives" (p. 390). Furthermore, Hammell (2020) contended that "issues of occupational rights, of the denial of occupational rights (i.e., occupational injustices), and of in/equities of occupational opportunities ought to be fundamental issues for the international occupational therapy profession" so that "all people have the capabilities to engage in meaningful occupations that contribute positively to their own well-being and the well-being of their communities, as is their right" (p. 392).

Applying these concepts to play occupation, then, while increasing children's skills has traditionally been the objective of occupational therapy play research and clinical intervention, a focus on the impact of the environment on children's ability to participate in play has broadened the scope of research and intervention (Sterman et al., 2016) as it expands upon traditional individual/person-focussed approaches. Indeed, following direction from the ICF (WHO, 2001) as well as researchers, stakeholders (including occupational therapists) who work to enable play for children began to focus on the issue of participation through the lens of social inclusion (Prellwitz & Lynch, 2018). In this way, occupational therapists extended their focus from impairments and remediation approaches in therapy provision to also include activity and participation in the environment (Prellwitz & Lynch, 2018). Nevertheless, occupational therapy researchers have recently called upon occupational therapists to address children's play rights and take seriously the need to increase their understanding of how environments support or prevent participation in play occupation and contribute to the occupational justice agenda of creating the context for the realisation of their participation rights (Lynch et al., 2020; Moore & Lynch, 2015; Sterman et al., 2016).

Thus, to address these research needs and gaps, this doctoral research focuses on how to better support occupational participation (i.e., play occupation) through the design of shared built environments for play (i.e., public playgrounds). In doing so, the research contributes to the growing knowledge base on the relationship between the design of the built environment and people's health, social participation, and attainment of human rights. Further, it attends to issues of occupational rights, the denial of occupational rights, and of in/equities of occupational opportunities and applies both individual and collective approaches to occupational justice to enable participation in play occupation.

Built environments for play

The value of play for children's development, health, and wellbeing is becoming increasingly recognised (e.g., Ginsburg et al., 2007; Milteer et al., 2012; Moore & Lynch, 2018a) and one of the most important play categories which poses a significant impact is outdoor play (Loebach et al., 2021; Lynch et al., 2020; Tremblay et al., 2015). Though ambiguity exists in terminology, playing outdoors, is commonly described as "outdoor play" or "outdoor time" (outdoor play hereafter) (Lee et al., 2021). Although any space can become a space for play to occur (Spitzer et al., 2023), outdoor play typically takes place in homes, local neighbourhoods, schools, public spaces, and locations found by children to suit their play needs (Casey, 2017). Such locations can include non-designated play spaces such as parking lots, derelict sites, footpaths, beaches, and designated play spaces such as public playgrounds (Lynch et al., 2019).

Studies with children in North America and Europe highlighted that they prefer to play outside (Blake et al., 2018; Glenn et al., 2013; Kilkelly et al., 2016a; Norðdahl & Einarsdóttir, 2015). Outdoor play tends to involve increased physical activity (Burdette et al., 2004; Ferreira et al., 2007; Floyd et al., 2011; Lynch et al., 2020; Schoeppe et al., 2013), provide opportunities to explore risk (Sandseter, 2009a, 2009b), and trigger children's innate curiosity about the natural world (Dietze & Kashin, 2019). Researchers have attributed a myriad of social, emotional, cognitive, and physical benefits for children engaging in outdoor play that is less supervised, less structured, more adventurous and includes elements of challenge and risk (Alexander

et al., 2012; Brussoni et al., 2015; Gill, 2007, 2014; Gray et al., 2015; Sandseter, 2009a, 2009b; Sandseter & Kennair, 2011).

For example, outdoor play has also been connected with positive effects on cardiorespiratory fitness (Schaefer et al., 2014) and cardiovascular and metabolic health biomarkers (Clements, 2004), together with overall health (Alexander et al., 2012; Brussoni et al., 2012) and quality of life in children (Bento & Dias, 2017). Moreover, while playing outside, children benefit from being exposed to sunlight, natural elements, and open air, which contributes to a stronger immune system, bone development, as well as physical activity (Bilton, 2010; Dyment & Bell, 2008). Additionally, outdoor play enables children to establish social contacts with peers (Dowdell et al., 2011), and develop a more positive relationship with the natural environment (Bixler et al., 2002). Significantly, inclusion and belonging are core features associated with participation in outdoor play (Bundy et al., 2008; Lyons et al., 2016) and the importance of daily opportunities for outdoor play was stressed by a cross-sectorial group of partners, stakeholders, and researchers, when they collaborated to develop an evidence-informed Position Statement on active outdoor play (Tremblay et al., 2015).

Nonetheless, despite these apparent benefits, there is considerable evidence that children's outdoor play opportunities have steadily declined across the past several generations particularly in the global north (Clements, 2004; Dodd et al., 2021; Gray, 2011; Hofferth, 2009; Hofferth & Sandberg, 2001a, 2001b; Horton, 2017; Karsten, 2005; Lee et al., 2021; Loebach et al., 2021; Shaw et al., 2013; Skår & Krogh, 2009; Tremblay et al., 2015; Valentine & McKendrck, 1997; Veitch et al., 2006; Witten et al., 2013). While there are potentially multiple layers of influence on diminishing outdoor play opportunities (Lee et al., 2021), researchers have attributed a range of ongoing societal shifts, as contributing factors. These include, for example: urbanisation, neighbourhood social and environmental conditions, technological advancements, children's safety and parental concerns, lifestyle changes, children's perceptions of outdoor play, and changing social norms around children's independent mobility (Brussoni et al., 2012; Carver et al., 2008; Kyttä et al., 2015; Loebach et al.,

2021; Schoeppe et al., 2016; Shaw et al., 2015; Singer et al., 2009; Tremblay et al., 2015; Valentine & McKendrck, 1997; York et al., 2003).

Reductions in play opportunities have been documented internationally with researchers coining terms such as "play deprivation" (Bundy et al., 2011) and "poverty of experience" (Welsh Government, 2014). Overall, these trends are said to constitute a generation of "play-malnourished", "battery-reared", "bubble-wrapped", "chauffeured", "couch kids" (Cole, 2005; Department for Culture Media and Sport, 2006; Gill, 2004; Romero, 2010; Voce, 2015; Wheway, 2007). Moreover, researchers have attributed the rise of childhood obesity and childhood psychopathology at least partly to the decline in outdoor play (Barron, 2013; Bundy et al., 2011; Ginsburg et al., 2007; Gray, 2011).

Moreover, GC17 (CRC, 2013) identified that certain groups of children are at increased risk of play deprivation; these groups include children with disabilities, girls, children living in poverty, children in institutions, children from indigenous and minority communities as well as children in situations of conflict, humanitarian, and natural disasters. And while decreased opportunities apply to many children, it is potentially amplified for children with disabilities because of additional factors including attitudinal, physical, and social barriers resulting in reduced opportunities to benefit from participating in play compared with other children (Anaby et al., 2014; Schreuer et al., 2014). The implications of decreased opportunities for children to benefit from participating in outdoor play are disquieting because of the multiple developmental and wellbeing benefits attributed to outdoor play (Bundy et al., 2011; Lynch, Moore, et al., 2018). Nevertheless, diminishing opportunities for children to participate in outdoor play indicates a violation of children's rights and society's failure to protect and provide for the right to play (Alden & Pyle, 2019). Therefore, a greater understanding of how to design and provide for children's outdoor play is crucial as a way of providing inclusive environments that extend the benefits of participating in outdoor play for all children.

Steinfeld and Maisel (2012) asserted that, in general, attention has been directed toward the design of built environments in terms of how they contribute to people's

health, social participation, and attainment of human rights. The design of built environments is recognised as being critically important for promoting engagement in meaningful occupations, and for facilitating all people, regardless of ability, to participate within their communities (Canadian Association of Occupational Therapists [CAOT], N.D.). The built environment refers to human-made surrounding that provides the setting for people to participate in meaningful occupations, including physical buildings, open spaces, and their supporting infrastructure (e.g., transport networks) (Coleman, 2017; Watchorn et al., 2021).

The term 'play space' is a "transferable and loose notion that can be applied to any environment in which a child chooses to play" (Woolley & Lowe, 2013, p. 54). While it is recognised that children play takes place along a continuum of outdoor and natural environments from nearby built environment spaces (e.g., streets, designated playgrounds, and local landscaped parks), to natural wild spaces (e.g., forests, grasslands, and beaches) (Alden & Pyle, 2019), and there are many views about ways in which play opportunities in outdoor spaces can be enhanced (Donoff & Bridgman, 2017), public playgrounds, the focus of this thesis, are important environments that have been specifically designed and designated as a place in which children can play (Casey, 2017; Woolley & Lowe, 2013). Public playgrounds have been identified as important built environments for outdoor play, social participation, and inclusion in many contexts around the world (Lynch et al., 2020; Lynch, Moore, et al., 2018; Moore & Lynch, 2015; Nabors et al., 2001; Rigby & Gaik, 2007; Talay et al., 2010).

The public playground environment

In many contexts around the world, public playgrounds are regarded as critical outdoor places for social inclusion and play (Lynch et al., 2020; Lynch, Moore, et al., 2018; Moore & Lynch, 2015; Nabors et al., 2001; Rigby & Gaik, 2007; Talay et al., 2010). Research has shown that in playgrounds children have opportunities to develop different skills, learn social norms and values, take risks, test their limits, and interact with other children (Fjørtoft, 2001; Siu et al., 2017; Turner et al., 2009). Playgrounds also provide meaningful opportunities for social interaction between children and parents of different social and ethnicity characteristics (Bennet et al., 2012; Moore & Cosco, 2010) and are identified as significant in enabling the inclusion of children

with disabilities (Olsen & Dieser, 2012; Siu et al., 2017). Therefore, participating fully in public playgrounds has potential for wide-reaching benefits that extend beyond childhood and beyond public playgrounds (Yantzi et al., 2010). However, the notion that children need separate places for play is a modern idea, virtually unknown before the nineteenth century (Pascoe, 2017). The next sections will present a brief history of public playgrounds before discussing modern public playgrounds.

A brief history of public playgrounds

Once viewed as mini-adults, capable of adult responsibilities such as work (Ariès, 1960; Clarke, 2004), political and social reforms in the 1800s were pivotal in redefining the way children were defined and understood in the global north. Specifically, children were redefined as conceptually different to adults and perceived as vulnerable and in need of adult protection (Cunningham, 2012; Hendrick, 2015; Heywood, 2017; Pascoe, 2017). But as industrialisation and urbanisation grew (Woolley & Lowe, 2013), so did trans-national movements that lobbied for special places for children across North America, Europe, Australia, and New Zealand (Pascoe, 2017), fuelled by a perception that purpose-built playgrounds would keep children away from less suitable places, such as busy streets, and from unsought influences like juvenile delinquency (Frost, 1986; Hart, 2002).

Later influenced by physical fitness, health, and nationalistic motives (e.g., reduction of childhood disease), the play movement emerged in Germany, where outdoor gymnasia and sandpits were created (Frost, 2012; Wassong, 2008). Their influence spread in the second half of the nineteenth century following the writings of Frederick Froebel and John Dewey, who emphasised the importance of play for children's overall development (Frost, 2012; Pascoe, 2017). 'Sand gardens' from Germany were replicated in the USA during the 1800s before 'model playgrounds' were developed in parks and schools in the late nineteenth century (Pascoe, 2017). Subsequently, the Playground Association of America was established in 1906 and by mid-1910 the playground movement spread rapidly in the USA (Frost, 2012; Pascoe, 2017), with the number of cities operating playgrounds expanding from 41 in 1906 to 5006 in 1924 (Frost, 2012).

Furthermore, the playground movement spread to other parts of the world, such as Australia (Gatley, 2001), Palestine (Shehory-Rubin & Shvarts, 2010), and the UK (Pascoe, 2017). The desire to create safe and contained play areas for children continued to grow in global north contexts throughout the twentieth century. Specifically, in Ireland, the context in which this doctoral research was undertaken, the Civics Institute of Ireland established ten playgrounds during the 1920s and 1930s in response to the large numbers of unsupervised children playing on the streets of Dublin (Kernan, 2005). To protect children from the perceived dangers of the city streets and safeguard the streets from crowds of unsupervised children playing, these ten playgrounds provided children aged between four and fourteen years a place to play, when schools were closed (Kernan, 2005). The first playground was opened on 12 September 1933, and between 1933 and 1939, the number of playgrounds opened and managed by the Civics Institute of Ireland increased to ten (Kernan, 2005). All but one playground were in the north and south inner city of Dublin and play leaders would supervise the children attending and organise a range of activities and games (Kernan, 2005). Overall, the emphasis was on the fresh air and the provision of outdoor activities, alongside developing civic behaviour (Kernan, 2005).

More broadly speaking, in many contexts in the global north, what resulted were fenced playgrounds that occupied several acres and consisted of running tracks, sports fields, community buildings (e.g., libraries), and playground apparatus (e.g., seesaw, monkey bars, rings, slides, and ladders) (Frost, 2012; Pascoe, 2017). In Ireland, the ten playgrounds included fixed playground equipment (swings, see-saws, jungle-gyms, an 'ocean-wave', wooden rockers); however, of significance to the children were the seasonal street games (hopscotch, marbles, tops, 'Snatch the Bacon', 'Rats and Rabbits'), organised team games (rounders, tennis, basketball, football), as well as imaginative and creative play through the provision of loose materials and props (balls, ropes, bats, sand, buckets) (Kernan, 2005). However, the Great Depression and World War II meant that playground development slowed during the 1930s and 1940s, as resources were diverted and many fell into disrepair (Frost, 2012; Galindo, 2012; Pascoe, 2017). Indeed, the intention by the Civics Institute of Ireland was to provide more playgrounds, however war shortages meant that a lack of funds and difficulty accessing equipment prevented this from happening (Kernan, 2005).

Nevertheless, even as these events were occurring, a new type of playground – the junk playground – first created by Danish landscape architect Carl Theodore Sorensen in 1943 was emerging in the Danish landscape (Frost, 2012; Galindo, 2012; Pascoe, 2017). Inspired by the observation that children would raid construction sites, garbage dumps, junk yards and wild places for supplies to build their own dens, forts and houses, junk playgrounds consisted of leftover bits and pieces that placed children in the role of designer and builder with trained play leaders (Frost, 2012; Pascoe, 2017). The junk playground idea spread across Europe, North America, and the Asia-Pacific (Pascoe, 2017), and was introduced to the UK by Lady Allen of Hurtwood in 1945 (Glasheen, 2019; Highmore, 2013). Lady Allen established several adventure playgrounds (term coined to describe junk playgrounds) in post-war UK for children with disabilities and influenced the development of many accessible playgrounds for all children (Frost, 2012; Pascoe, 2017). However, most of these playgrounds survived for only short periods because of concerns about their dishevelled appearance, fears of legal liability in the event of accidents, a lack of funding, and a shortage of play leaders (Pascoe, 2017; Peterson, 2011).

Even so, playground design and construction flourished after the end of World War II in 1945 as many countries entered a period of economic prosperity (Pascoe, 2017). Playground historian Joe L. Frost noted that to compensate, complement, or substitute for the surfaces and equipment on typical municipal playgrounds, the era of 'novelty' playgrounds emerged in the 1950s (Frost, 1989, 2012). During this era, designers created novelty, imaginative, or fantasy sculptures (e.g., rockets, vehicles, and historical pieces) (National Recreation Association, 1954, 1957), influenced by the popularity of television, space travel, westerns, and Disneyland (Frost, 2012). However, it was during the 1960s and 1970s that playgrounds entered mass-production (Pascoe, 2017), resulting in playgrounds that were less diverse and less interesting (Clendaniel, 2009; Pursell, 2011) because of a rise in safety concerns and a fear of litigation (Pascoe, 2017). By the 1960s and 1970s in Ireland, attendance at the ten supervised playgrounds had dropped, and the Civics Institute of Ireland began to wind down its activities (Kernan, 2005). By 1971, the Civics Institute of Ireland handed over the management of the playgrounds to the Parks Section of Dublin Cooperation. In 1976 the Dublin Cooperation produced an internal report which

suggested that the low usage of the playgrounds "was due to the dull, drab and generally unattractive appearance of the centre, the absence of facilities to play with water, and lack of imaginative games and hideaway spaces and green areas" (Kernan, 2005, p. 686).

From the 1970s, national standards for playground equipment safety, written specifically to eliminate known hazards based on childhood injury and mortality statistics (Little & Eager, 2010), were adopted by nations in the global north (Pascoe, 2017). Overall, this historical trend has progressively made playgrounds safer (Pascoe, 2017) but was subsequently criticised in what Hart (2002) describes as a paranoid attempt to create no-risk environments which ultimately restrict children's opportunities for free play as adults became overly concerned with protecting children. Indeed, since the late 1960s, public playgrounds in many contexts around the world have been criticised as being poorly visited and of little use to children (Naylor, 1985; Wuellner, 1979). Moreover, they have been criticised for causing isolation and marginalisation of children (Goodman, 1979; Noschis, 1992), and for being static, boring, and not corresponding to the needs and preferences of children (Hart, 2002; Holme & Massie, 1970; Moore, 1989; Wardle, 1990; Woolley, 2008).

Nevertheless, with the turn of the century in the 1990s, modern playgrounds in many contexts around the world expanded to accommodate broader purposes and more diversified play materials and spaces (Frost, 2012). Frost (2012) concluded that modern playgrounds took on even broader meanings to include people of all ages, (intergenerational playgrounds), natural and built (integrated playgrounds elements), provisions for people of all abilities (accessible playgrounds) and electric power (cyber playgrounds); modern playgrounds will be presented next.

Modern public playgrounds

In many contexts around the world, modern public playgrounds are specifically designed for children to explore their surroundings and expand their capabilities (Little & Eager, 2010). They are considered to have a crucial role in protecting outdoor space and portraying a public message that children are welcome to play in a particular locality (Casey, 2017). They are generally adult-planned and managed outdoor play

spaces (Burke, 2013), and are usually located in neighbourhoods or at locations that playground users drive or take public transportation to (Daniels & Johnson, 2009). They offer structured, free-of-charge, and seemingly safe spaces for children to participate in outdoor play (Lundman, 2021), and typically contain play equipment and structures with paths to and between equipment (Brown et al., 2021). While certain structures and playthings have come to be associated with playgrounds such as sandboxes, swings, slides, and climbing structures (Kuhaneck & O'Brien, 2023), in a research study that interviewed 141 children aged 6 – 11 years across two Swedish communities, it was found that children consider a playground as a place where they can be social, and where there are enough activities that allow for fun (Jansson, 2008).

However, and despite the criticisms expressed in the past, many modern playground designs continued to face criticism (e.g., Jansson, 2010; Woolley, 2008; Woolley & Lowe, 2013). Indeed, in many contexts around the world they have been criticised for causing isolation and marginalisation of children (McKendrick, 1999), and questioned as a method of providing children access to the public space (Cunningham & Jones, 1999; Hart, 2002; Noschis, 1992). Moreover, they have been criticised for their apparent homogenisation and "cookie cutter" approach to design consisting of look-alike, isolated pieces of equipment in a monoculture of grass (Hendricks, 2011; Herrington & Studtmann, 1998; Woolley, 2008). To demonstrate this phenomenon Woolley and Lowe (2013) dubbed the term KFC (Kit, Fence, Carpet) playgrounds to describe modern playground designs that consist of "a kit of fixed play equipment, with a fence surrounding it and a carpet of rubber surface" (p. 56).

Indeed, modern playground designs have been widely criticised for being predictable and boring with limited play value (Czalczynska-Podolska, 2014; Frost, 1992; Lynch et al., 2019; Tierney, 2011; Woolley & Lowe, 2013), for being increasingly sterilised of challenge and risk-taking opportunities (Ball et al., 2019; Little & Eager, 2010; Woolley & Lowe, 2013), and for attracting children only when they are new (Langendorfer et al., 2008). While there are numerous factors underpinning modern playground designs, researchers have repeatedly identified the omnipresent standardisation of playgrounds (e.g., health and safety legislation) as contributing to the "sameness" of public playgrounds in many contexts around the world (Ball et al.,

2019; Hendricks, 2011; Jongeneel et al., 2015; Lundman, 2021; Woolley & Lowe, 2013). Indeed, Jansson and Persson (2010) determined that while standards have had great influence, actual users have very little.

Significantly, researchers have acknowledged that risk-management has become a common practice in playground planning in many contexts around the world to minimize the risk of injuries (e.g., Ball, 2004; Ball et al., 2019; Gill, 2007, 2017; Little & Eager, 2010; Richmond et al., 2018). Consequently, playground providers are buying ready-made and standardised play equipment from a manufacturer (Lundman, 2021), yet researchers have identified that manufactured playgrounds exclude other play environments, such as adventure playgrounds, where children can play more (Frost, 2006; Staempfli, 2009). Moreover, natural elements, such as trees, stones, and water are perceived as problematic and therefore avoided for safety reasons (Lundman, 2021). Yet, in comparison to manufactured playgrounds, greater play value has been noted in naturally designed playgrounds (e.g., Luchs & Fikus, 2013; Woolley & Lowe, 2013) and adventure playgrounds (Staempfli, 2009); therefore, Lundman (2021) asserted that the preference of manufactured play equipment has social and developmental consequences.

Even so, Little and Eager (2010) assert that the provisions contained within playground equipment standards "provide the playground designer with the opportunity to achieve the dual objective of designing a playground that is free from hazards that are obvious to the child while at the same time exposing the child to managed levels of risk" (p. 511). They further articulate that children desire "stimulating, challenging play through which they can explore risk and experience a sense of achievement" (Little & Eager, 2010, p. 511). Therefore, the aim should be to move towards the provision of playgrounds that provide greater challenge for children and managed levels of risk. While there has been some loosening of attitudes concerning playground safety in some contexts around the world (Gill, 2007), most notably with the development of a risk management tool known as the "risk benefit assessment" (RBA) (Ball et al., 2019), Burke (2013) acknowledged that a continued focus on safety in playground research means that issues such as inclusive playground

provision are less likely to be the subject of mainstream studies, and thus, many children face significant barriers in realising their Article 31 rights.

Nevertheless, researchers have been proposing for some time that the physical and social environments of community playgrounds can inadvertently perpetuate marginalisation and exclusion. Exclusion in community playgrounds is thought to occur through different mechanisms, most of which are neither intentional nor recognised as exclusionary (Yantzi et al., 2010). Certainly, playground design is often informed by normative understandings of children's bodies, mobilities, and abilities (Brown et al., 2021) and as a result, many children, and their families, who do not fit within such norms, experience public playgrounds as sites of spatial and social exclusion because of physical barriers to access and social barriers to participation (e.g., Jeanes & Magee, 2012; Lynch et al., 2020; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Sterman et al., 2019).

Moreover, public playgrounds, by their nature, are typically organised spaces that offer children a range of opportunities to play in many contexts around the world; however, the organised nature of such spaces may not adequately accommodate the diverse range of children's abilities, interests and preferences that are associated with inclusion. Consequently, many children, particularly children with disabilities and their families, experience barriers meaning that access to public playgrounds is limited, and the play opportunities afforded are not inclusive. Common barriers include the operationalization of policies (e.g., an over reliance on safety policy), the types of equipment and surfaces that are used, inadequate access (e.g., inaccessible routes), inadequate play options and play value (e.g., providing limited choices), and limited opportunities for social interaction (e.g., as a consequence of barriers in the physical environment) (Jeanes & Magee, 2012; Lynch, Moore, et al., 2018; Moore & Lynch, 2015; Olsen & Dieser, 2012; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Prellwitz et al., 2001; Ripat & Becker, 2012; Yantzi et al., 2010).

Nonetheless, Goltsman (2011) identified that it is possible to create well-designed play spaces that successfully integrate the needs of all children. Moreover, Article 23 of the UNCRC indicates that children with disabilities "should enjoy a full and decent life,

in conditions which ensure dignity, promote self-reliance and facilitate the child's active participation in the community" (UN, 1989). Additionally, Article 31 of the UNCRC explicitly acknowledges play as a human right of all children (UN, 1989). Therefore, there is a fundamental need to design public playgrounds that are inclusive for all, with the goal of equality in opportunity for all users. Indeed, in 2010, the UN specifically stated that "to achieve full inclusion, an accessible, barrier-free physical and social environment is necessary" (UN, 2010, p. 22). Thus, the next section will focus on designing for social participation and inclusion.

Designing for social participation and inclusion

As noted earlier, both GC17 (CRC, 2013) and GC2 (CRPD, 2014) acknowledge that the way forward is to endorse UD for designing environments (including public playgrounds) that are inclusive for all. Subsequently, play researchers around the world have supported UD for developing and providing public playgrounds that support outdoor play, social participation, and inclusion (e.g., Burke, 2013; Casey, 2017; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018; Prellwitz & Skär, 2007; Woolley, 2013). Researchers have specifically endorsed UD to reframe playground design as "the architecture of social participation" with the goal of designing for social inclusion and participation (Lynch, Moore, et al., 2018; Steinfeld & Maisel, 2012). Before introducing UD as a specific approach to design, it is necessary first to describe what is meant by design. The next section will briefly describe how design is conceived before introducing UD and its application for public playground design.

Design

Due to social, technological, and market changes, as well as the evolution of the discipline itself, there are many and diverse ways of understanding, defining, or describing design (Ángel & Batista, 2020). In a review of definitions, Ángel and Batista (2020) concluded design "has been conceived, described, or understood in different ways" (p. 27). Some authors define it from a *semantic meaning* of the word, as something related to becoming or a future action (Hunt, 2011; Simon, 1996); others highlight the *project activity* (Alexander, 1973; Cross, 2006; Parsons, 2018; Vilchis, 2014); others emphasise the *creative act*, as an action generating ideas (Faimon &

Weigand, 2004; Wong, 1972); others highlight the character of design as a *cultural* element (Juez, 2002; Sparke, 2013); and others focus on the role it plays in the *production process* within industrial society (Chaves, 2017). Notwithstanding the variability, Ángel and Batista (2020) assert that design "is all of the above as a whole … to look at design only through one of these perspectives is to look at a partial and incomplete image" (p. 27).

Moreover, Ángel and Batista (2020) assert that the holistic reality of design cannot be understood if the focus is limited to the design process and the action of the designer. As design aims to improve the human experience (Atkinson, 2017), Ángel and Batista (2020) determined that design "exists and manifests itself through the coexistence of two worlds: that of the user and that of the designer" (p. 30). They further articulate that it is assumed that the user (individual or collective) has a real or potential need, which is intended to be solved through an artefact or product resulting from a designer (Ángel & Batista, 2020). As such, the relationship between the user and the product of the design is as important as the design process, because through this experience, the user gets the experience of use, and subsequently, the design process achieves its true dimension and meaning (Ángel & Batista, 2020).

Overall, Ángel and Batista (2020) emphasised that design must be approached from a "holistic, complete and integral perspective" accounting for the context (historical and geographical) in which it takes place, as well as the elements through which the design materialises (p. 32). They conclude that these elements comprise: (a) the user, (b) the designer, (c) the designed object, and (d) the active and dynamic relationship between these components (Ángel & Batista, 2020). Although the term design refers to a broad range of applications, for example, graphic design, industrial design, space design, interior design, service design, experience design, costume design, and architecture (Ángel & Batista, 2020), in the context of this thesis it refers to the design of public playgrounds.

This emphasis on design needing to be holistic encompasses the work of Ronald Mace, who introduced UD as a specific design approach in 1985 to describe: "a way of designing a building or facility, at little or no extra cost, so that it is both attractive and

functional for all people, disabled or not" (Mace, 1985, p. 147). According to Steinfeld and Shea (2001), the objective of UD is "to accommodate everyone at all times with the same design or provide choices for different needs" (p. 35.2). Moreover, Imrie (2012) asserted that "the epistemic basis of UD is premised on significant user involvement in the design process" (p. 878). In sum, UD as an approach to design incorporates the elements described previously. UD will be introduced next, and its application to public playground design will be considered.

Universal Design

Rooted in architecture and environmental design, the term UD was first introduced by its pioneer Ronald Mace in 1985 to describe, as previously noted: "a way of designing a building or facility, at little or no extra cost, so that it is both attractive and functional for all people, disabled or not" (Mace, 1985, p. 147). Other researchers have defined UD as a *movement* that approaches the design of the environment, products, and communications with the widest range of users in mind (Knecht, 2004) and as a *process* of embedding choice for all people in design (Salmen, 2011). At the core of UD is its commitment to inclusion and the provision of environments that can fully be experienced by all people irrespective of age, gender, class, or ability (Gossett et al., 2009).

Regardless of the definition or the terminology, one of the most useful contributions for explaining the concept of UD is the Principles of UD. Indeed, between 1994 and 1997, the Centre for UD at North Carolina State University conducted a research and demonstration project to further develop UD (Story, 2001). One of the activities of the project was to develop a set of UD guidelines, which resulted in the 7 Principles of UD (Connell et al., 1997). Each of these principles were defined and further expanded in a set of guidelines to clarify the scope of UD and provide guidance in both design and evaluation activities (Steinfeld & Maisel, 2012). The guidelines described key elements that should be present in a design adhering to the principle (Table 2).

Table 2: The seven principles of UD, Version 2.0 (Connell et al., 1997)

Principle 1: Equitable Use The design is useful and marketable to people with diverse abilities.

Guidelines:

a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
b. Avoid segregating or stigmatizing any users.
c. Make provisions for privacy, security, and safety equally available to all users.
d. Make the design appealing to all users.

Principle 2: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

Guidelines:

a. Provide choice in methods of use.
b. Accommodate right- or left-handed access and use.
c. Facilitate the user's accuracy and precision.
d. Provide adaptability to the user's pace.

Principle 3: Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

Guidelines:

a. Eliminate unnecessary complexity.
b. Be consistent with user expectations and intuition.
c. Accommodate a wide range of literacy and language skills.
d. Arrange information consistent with its importance.
e. Provide effective prompting and feedback during and after task completion.

Principle 4: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
b. Maximise "legibility" of essential information.
c. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
d. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Principle 5: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
b. Provide warnings of hazards and errors.
c. Provide fail-safe features.
d. Discourage unconscious action in tasks that require vigilance.

Principle 6: Low Physical Effort

The design can be used efficiently and comfortable and with a minimum of fatigue.

Guidelines:

a. Allow user to maintain a neutral body position.
b. Use reasonable operating forces.
c. Minimise repetitive actions.
d. Minimise sustained physical effort.

Principle 7: Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

a. Provide a clear line of sight to important elements for any seated or standing user.
b. Make reach to all components comfortable for any seated or standing user.
c. Accommodate variations in hand and grip size.
d. Provide adequate space for the use of assistive devices or personal assistance.

In recent years, UD has become widely endorsed by international institutions such as the UN and the World Health Organisation (WHO), and by several national and subnational government, non-governmental and private sector organisations (Ginnerup, 2009; Lord et al., 2010; Snider & Takeda, 2008). This is emphasised by the inclusion of UD in the UNCRPD (UN, 2006), where UD is defined in Article 2 as:

> "Universal design" means the design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without

> the need for adaptation or specialized design. “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

Moreover, in Article 1 of the UNCRPD (UN, 2006), persons with disabilities are described as follows:

> Persons with disabilities include those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.

Yet, before the international endorsement of the concept of UD, a variety of related non-discriminatory planning and design concepts like “barrier-free design”, “accessible design”, “inclusive design”, and “design for all” were prominent. While UD has its roots in the barrier-free design and accessible design approaches (Persson et al., 2014), these concepts precede the UD concept and are linked to negative associations of designing for a sub-set of the population (i.e., persons with disabilities) (Clarkson & Coleman, 2015; Ostroff, 2011). Inclusive design and design for all concepts are regarded as synonymous with UD (Heylighen et al., 2017). In addition to inclusive design, design for all has become a prevalent term in the UK and much of northern and central Europe (Heylighen et al., 2017; Luck, 2018; Ostroff, 2011). However, researchers identified that “despite their different place of origin and some semantic distinctions” (Heylighen et al., 2017, p. 507), their similarities are more apparent than the differences (Heylighen et al., 2017; Ostroff, 2011). Indeed, Heylighen and colleagues (2017) asserted that “all these concepts share a similar purpose”, that is, to include as many people as possible (p. 507).

While further terms are used in the USA, such as life-span design and transgenerational design (Ostroff, 2011), what differentiates UD is that it is underpinned by seven principles (outlined in Table 2 above) and eight goals (Table 3) and is explicitly endorsed by the UN. Such endorsement meant that researchers hailed UD as a “new orthodoxy” of what is presented as the very best of design practice (Imrie, 2012, p.873). Still, Imrie (2012) emphasised that the use of the term “without” in the UNCRPD definition of UD ignores particular and individual-specific design

features or elements that may be required by some users with disabilities. Imrie (2012) specifically achknowledged that while the UD concept aims to provide designed environments that cater for all, no one size fits all, and thus, environments need to be sensitised to users that are not easily met by universal solutions.

Table 3: The eight goals of UD (Steinfeld & Maisel, 2012)

Goal 1: Body Fit Accommodating a wide range of body sizes and abilities.
Goal 2: Comfort Keeping demands within desirable limits of body function.
Goal 3: Awareness Ensuring that critical information for use is easily perceived.
Goal 4: Understanding Making methods of operation and use intuitive, clear, and unambiguous.
Goal 5: Wellness Contributing to health promotion, avoidance of disease, and prevention of injury.
Goal 6: Social Integration Treating all groups with dignity and respect.
Goal 7: Personalisation Incorporating opportunities for choice and the expression of individual preferences.
Goal 8: Cultural Appropriateness Respecting and reinforcing cultural values, and the social and environmental contexts of any design project.

Moreover, Imrie (2012) identified that because of the intuitive appeal and global reach of UD, it tends to be accepted as a good thing. However, Sandhu (2011) argued that the development of the concept of UD lacked universality and, therefore, "not only is the link between demographics, legislation, and economics deficient, but there is also an underlying assumption that there is somehow a UN of universal design to which all should subscribe" (p.44.5). Furthermore, researchers have found that UD is yet to filter into many of the practices of professionals involved in the production of built environments (Imrie & Hall, 2001). While the reasons are potentially numerous, Imrie (2012) acknowledged that there has been little or no evaluation of the underlying

principles and theoretical and conceptual content of UD. Moreover, researchers have identified that the technical feasibility, practical applications, and operational outcomes of UD have largely been overlooked (Crews & Zavotka, 2006; Froyen et al., 2009; Rose, 2000). Furthermore, criticism was directed at the structure and content of the seven principles of UD (Steinfeld & Maisel, 2010) and researchers have argued that although a merging of design ideas based on human activity occurs, no universally designed solutions were mapped (O Shea et al., 2016).

Considering these issues, in 2012, Edward Steinfeld and Jordana Maisel refined the definition of UD as "a process that enables and empowers a diverse population by improving human performance, health and wellness and social participation" (Steinfeld & Maisel, 2012, p. 29). The refined definition is explicit about the outcomes of UD (i.e., improved health and social participation). Moreover, Steinfeld and Maisel (2012) proposed eight goals of UD to advance the concept beyond a focus of removing barriers, to also being about creating the right environmental conditions for inclusion and social participation that addresses the full diversity of the population. As described in Table 3 above, four of the goals are oriented toward human performance (Goals 1 – 4), with specific emphasis on anthropometry (body fit), biomechanics (comfort), perception (awareness), and cognition (understanding) (Steinfeld & Maisel, 2012). The other three goals address social participation outcomes (Goals 5 – 8), including cultural appropriateness (Steinfeld & Maisel, 2012). Wellness (Goal 5) addresses both human performance and social participation (Steinfeld & Maisel, 2012).

Yet despite these advances, and although UD in the built environment is commonly referenced, there is a lack of knowledge about UD as a design approach to date (Heylighen et al., 2017). O Shea and colleagues (2016) asserted that "UD is not easily investigated by traditional scientific methods of analysis and validation, there are no clear criteria for what constitutes a universally designed built environment, and there is little consensus on how UD principles should be applied or evaluated" (p. 2); consequently, research regarding its efficacy as a design approach remains emergent (Watchorn et al., 2021). Moreover, the uptake of UD, in general, is thought to be hampered by numerous factors, such as: (a) standardisation and accessibility legislation restricting design solutions, (b) limited education for UD and a consequent

lack of skills, tools or knowledge to practice UD or assess inclusivity, (c) barriers to UD evaluation, (d) confusion of UD with (wheelchair) accessibility or design for disability, (e) limited economic incentives and recognition in design awards to attend to UD, (f) perceptions that UD sacrifices aesthetics, raises costs, requires a more complex design process, and slows down time to market, (g) competing or conflicting requirements, (h) the client's influence or the company's culture, and (i) poor collaboration between stakeholders (Afacan & Erbug, 2009; Dong et al., 2004; Goodman et al., 2006; Gray et al., 2003; Heylighen, 2008; Heylighen et al., 2016; Heylighen et al., 2017; Manley et al., 2011; O Shea et al., 2016; Ostroff, 2011).

Notwithstanding the challenges, Article 1 of the UNCRPD articulated that "disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others" (UN, 2006, p. 4). This articulation shifted traditional views of disability from the level of individual responsibility to the interactional, and consequently, UD was endorsed as an approach which has the potential to enable people by dismantling disabling barriers and creating the right environmental conditions for social inclusion across all human abilities (Lid & Solvang, 2016). Thus, while UD was originally focused on disability rights, UD can focus on any civil rights because design for diversity is concerned with social justice for all (Steinfeld & Maisel, 2012). Furthermore, internationally, following direction from the UN to adopt UD (UN, 2006), UD is progressively being applied to policy relating to the design of built environments to reduce discrimination and enhance social participation (Watchorn et al., 2018).

Indeed, numerous legislative and policy documents are endorsing UD for public playground design (Appendix B). Specifically, in September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development (UN General Assembly, 2015). The 2030 Agenda provides a shared blueprint for peace and prosperity for people and the planet, now and into the future, and applies to both developed and developing countries (UN General Assembly, 2015). The 2030 Agenda encourages countries to integrate the Sustainable Development Goals (SDGs) into planning and policy, on both a national and international level (UN General Assembly, 2015). In

short, at the heart of the 2030 Agenda is the 17 Sustainable Development Goals (SDGs) and their respective 169 sub-targets (UN General Assembly, 2015). While many SDGs are applicable in the context of universally designed playgrounds (e.g., Goals 3, 10, and 11), Target 11.7 of SDG 11 specifically states that: "by 2030, provide universal access to safe, inclusive, and accessible, green, and public spaces …" (UN General Assembly, 2015, p. 22). Through the planning and provision of universally designed public playgrounds, Target 11.7 of SDG11 (UN General Assembly, 2015) could be achieved. UD and its application for public playground design will be described in the next section.

Universal Design and public playgrounds

Following direction from the UN to adopt UD (CRC, 2013; UN, 2006), play researchers have advocated for UD for providing conceptual guidance for designing playground environments that are accessible, usable, and inclusive of all (e.g., Burke, 2013; Casey, 2017; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Moore & Lynch, 2015; Prellwitz & Lynch, 2018; Prellwitz & Skär, 2007; Woolley, 2013). However, there are barriers to implementing UD in playground design; these include: (a) a lack of UD knowledge among playground professionals (Lynch et al., 2019, 2020; Prellwitz & Tamm, 1999; Prellwitz et al., 2001; Sterman et al., 2019; Woolley & Lowe, 2013), (b) a scarcity of guidance on how to operationalise UD in playground design (Lynch et al., 2019; Lynch, Moore, et al., 2018; Moore & Lynch, 2015), (c) a dearth of play-policy in the international context that incorporates UD (Lynch et al., 2018; Van Melik & Althuizen, 2022), (d) a paucity of attempts to translate UD principles to include play value as a central concern (Casey, 2017; Lynch et al., 2018), (e) a shortage of evidence on the effectiveness of UD (Moore & Lynch, 2015), and (f) inaccurate perceptions that UD raises costs (Lynch et al., 2019). Consequently, many communities are struggling to implement UD in public playground design (Lynch et al., 2019, 2020; Van Melik & Althuizen, 2022).

Research is evolving on inclusive playground provision in the public realm. While some of these examples have been previously considered in the context of occupational therapy and occupational science research, more broadly speaking, researchers have explored user perspectives (Bhuyan, 2022; Black & Ollerton, 2022;

Hill & Chawla, 2019; Lynch et al., 2020; Olsen & Dieser, 2012; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Stanton-Chapman & Schmidt, 2016, 2017a, 2018, 2019; Sterman et al., 2019; Wenger et al., 2021), investigated the perspectives of municipality representatives (Lynch et al., 2019, 2020; Prellwitz & Tamm, 1999; Prellwitz et al., 2001; Sterman et al., 2019; Van Melik & Althuizen, 2022), reviewed policy documents (Lynch, Moore, et al., 2018; Van Melik & Althuizen, 2022), analysed guidelines (Kim et al., 2018; Lynch et al., 2019; Lynch, Moore, et al., 2018; Olsen, 2015), studied research evidence (Alsarawi, 2020; Brown et al., 2021; Burke, 2013; Casey, 2017; Fernelius & Christensen, 2017; Moore & Lynch, 2015; Prellwitz & Lynch, 2018; van Engelen et al., 2021), developed tools to assess playground design (Dalprà, 2020; Gustat et al., 2020; Lynch et al., 2019; Parker & Al-Maiyah, 2022; Yoo et al., 2022), proposed frameworks for creating inclusive playgrounds (Olsen, 2015), evaluated playground design (Black & Ollerton, 2022; Lynch et al., 2019; Olsen & Dieser, 2012; Perry et al., 2018; Siu et al., 2017; Talay et al., 2010), investigated the frequency and duration of children playing on a universally designed playground compared to children playing on an inclusive playground (Stanton-Chapman et al., 2020), designed inclusive playgrounds (Stanton-Chapman & Schmidt, 2017b; Yuen, 2018), and advocated for children's right to participate in playground development (Schoeppich et al., 2021).

However, although UD for public playground design for inclusion is commonly referenced, there is a lack of clarity about what UD is or should be. As documented above, research efforts had intensified in recent years on inclusive playground provision in the public realm. However, no work has yet been done to explore the evidence for accessibility and usability of playground environments, either limited research or no research to date has systematically synthesised what is known from published, peer reviewed studies and grey literature guideline documents about inclusive public playgrounds; explored the ways in which UD is understood and implemented by a national sample of playground professionals (i.e., those that plan, design, and/or provide public playgrounds) in the Republic of Ireland; or determined the opportunities and barriers for diverse users and/or non-users to enjoy their rights to outdoor play, social participation, and inclusion in public playgrounds. Therefore,

there is a lack of evidence concerning the use of UD at a higher conceptual level as well as an applied level for playground design.

Moreover, the challenges in applying UD principles in the context of play have been noted (Casey, 2017; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018). Indeed, Casey (2017) reviewed principles three and six and identified that "the principles of low physical effort and simple and intuitive use may be deemed to confound the desire for play features requiring progressive levels of physical exertion or offering intrigue and surprise" (p. 371). Nevertheless, Valerie Watchorn and colleagues (2021) recently conducted an integrated literature review of the current discourse around UD in the built environment. Using the Person-Environment-Occupation (PEO) model (Law et al., 1996) as a theoretical framework for the review, they revealed that while much of the current discourse on UD and the built environment concentrates on the person and the environment, few efforts have focused on what people do in built environments (Watchorn et al., 2021). From this review it was concluded that the PEO model has the potential to advance the discourse around UD from personal and environment determinants only to include the occupations people perform in the built environment (i.e., occupations, or play occupation in the context of public playgrounds) (Watchorn et al., 2021). Therefore, the PEO model will be presented in the next section.

Person Environment Occupation model

Several ecological-social construction models have been proposed to describe the relationship between the person and the environment as dynamic, complex, and interdependent (Sanford, 2012); these include the: Human-Environment Interaction (HEI) model (Buchanan, 1987), Environmental Press (EP) model (Lawton, 1977), Enabling Disabling Process model (Brandt & Pope, 1997), and the ICF framework (WHO, 2001) for example. While all models can be discussed in the context of environmental design, the profession of occupational therapy has adopted a transactional model of performance, that is the PEO model, that recognises the environment as being inseparable from human function (AOTA, 2020; Law et al., 1996).

The PEO model is a theoretical model that describes the dynamic interaction that occurs between a person, their environment, and their occupations (Law et al., 1996). These main dimensions (person, environment, occupation) are represented by three inter-related circles or spheres and the extent of congruence in the person-environment-occupation (PEO) relationships is represented by the degree of overlap between the three spheres. The overlap in the centre of the spheres represents occupational performance or the dynamic experience of a person engaged within an environment overtime; the closer the spheres overlap, the greater the degree of harmony or fit (Figure 1).

The PEO model has been previously used at individual and macro levels to analyse and understand factors that may act as facilitators or barriers to people's performance in meaningful occupations (Broome et al., 2009; Maclean et al., 2012; Strong et al., 1999). Moreover, in the context of UD and built environment design, Watchorn and colleagues (2021) asserted that because the goals of UD in the built environment are prefaced on the aim to improve human performance, health and wellness, as well as social participation; the PEO model is "an appropriate choice to highlight how its application to the environment impacts upon the humans who use it, and the social participation they seek to engage in" (p. 2).

More specifically then, in the context of built environments for play, occupational therapists and occupational scientists attempt to create a person-environment fit for play by attending to the affordances for play, whilst also balancing familiarity and novelty to promote exploration (Robinson, 1977; Spitzer et al., 2023). First explored as a theoretical concept by James J. Gibson (Gibson, 1977), affordance theory considers how individuals develop an understanding of the world with a focus on the functional use of objects and the environment. The concept of affordances is commonly used for describing the qualities environments "afford" children (e.g., Fjørtoft & Sageie, 2000; Heft, 1988; Kyttä, 2004; Little & Sweller, 2015; Sando & Sandseter, 2020; Sandseter, 2009a, 2009b; Storli & Loge Hagen, 2010; Sundevall & Jansson, 2020); affordances refer to the properties of objects and the environment that invite a specific type of use or method of interaction (Gibson, 1977).

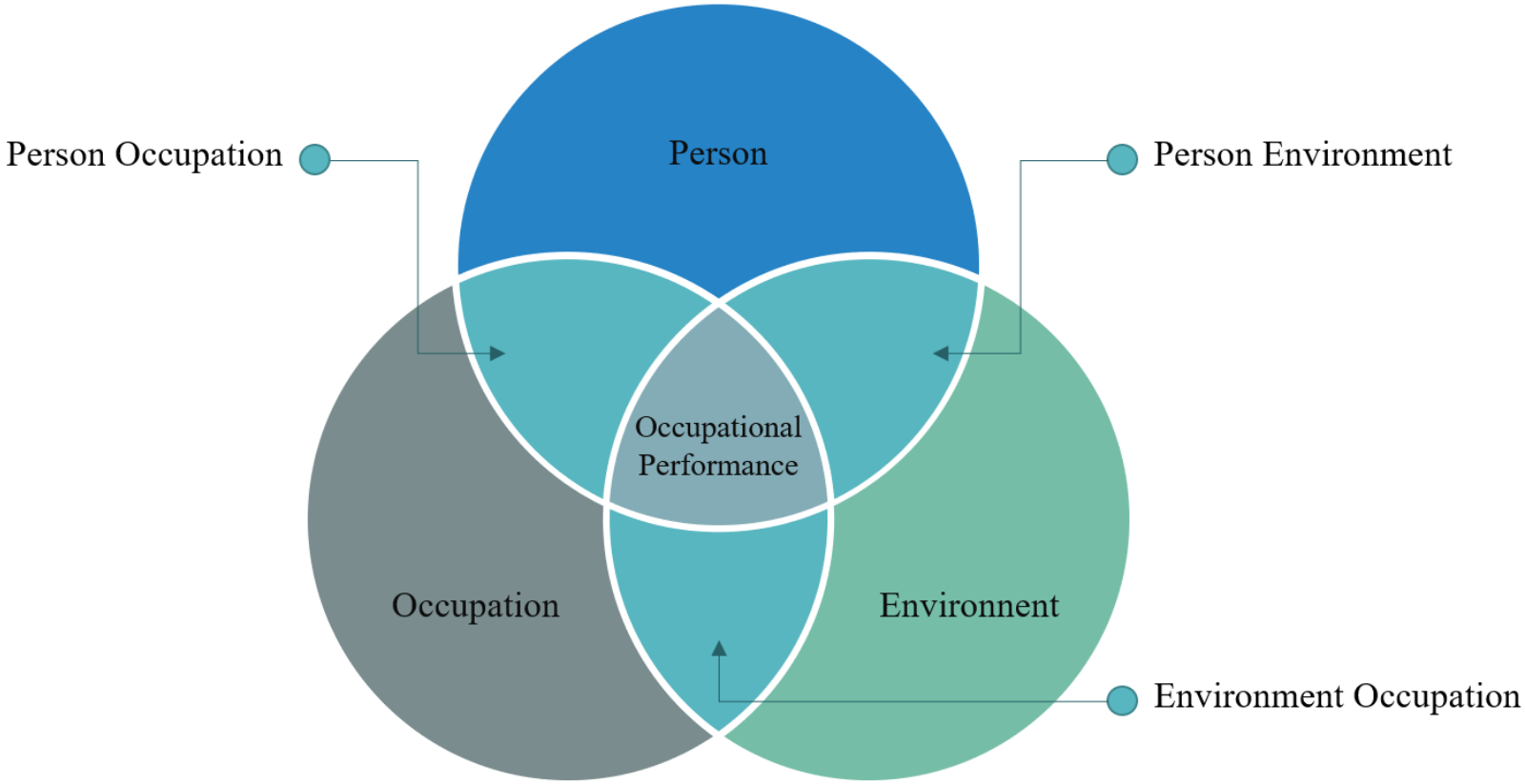


Figure 1: Person-Environment-Occupation model (Adapted from Law et al., 1996)

Person-environment fit theories are built on three hypotheses (Van Vianen, 2018). First, the fit between a person and the environment is a better predictor of outcomes than person or environment only (Spitzer et al., 2023). Second, the greatest outcomes are expected when the characteristics of the person and the environment are compatible (Spitzer et al., 2023). Third, positive outcomes are reduced when the match or fit between a person and the environment does not occur; this can be the result of too little or too much of an attribute (Spitzer et al., 2023). Together, these theories suggest that the fit between a child's characteristics and the play environment is significantly important when predicting play in play spaces (Spitzer et al., 2023). In relation to play and play spaces, researchers asserted that person applies to the player, environment relates to play spaces, playthings, and play mates, while occupation refers to play (Kuhaneck & Metz, 2023). Building on this work, Kuhaneck and Metz (2023) recently emphasised that to maximise person-environment fit, there is also a need to consider the broader context for play, including for example, the neighbourhood, culture, and policy.

Nevertheless, as noted by Watchorn and colleagues (2021), recent discourse around UD in the built environment primarily address the person and environment components of the PEO framework, over considerations of occupational and social participation within these spaces. Certainly, in the most up-to-date *Universal Design Handbook* (Preiser & Smith, 2011), there is a chapter dedicated to a Person-Environment Fit model (Webb et al., 2011). However, the goals of UD in the built environment are prefaced on the aim to "enable and empower a diverse population by improving human performance, health and wellness, and social participation" (Steinfeld & Maisel, 2012); thus, to reach its stated goals the discourse around UD cannot be limited to personal and environment determinants only (Watchorn et al., 2021). Rather, the discourse needs to include the occupations people perform in the built environment, and therefore incorporate a focus on occupational and social participation (Watchorn et al., 2021).

Therefore, the PEO model is an appropriate choice for this doctoral research to highlight how its application to public playground environments impacts upon the people who use it, and the social participation they seek to participate in. While play

researchers have, in recent years, intensified efforts on how to design for play in public playgrounds (Casey, 2017; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018), there has been limited research on the design and provision of public playgrounds from a UD perspective. As such, it is challenging to build a comprehensive model for applying UD to playgrounds due to the current lack of evidence to inform best practice. However, because the PEO model is an occupational therapy model, and because occupational therapy is commonly associated with disability, the next section will situate the thesis in relation to disability and UD.

Conceptualising disability in the context of Universal Design

Disability and UD are connected as the aim of UD is to promote equal rights and opportunities for all people to participate in society; therefore, practicing UD strategies imply some concept of person and disability (Lid, 2014). However, since the 1960s, there have been many models of disability that have featured significantly in shaping disability politics, disability studies, and human rights for persons with disabilities (Degener, 2016; Lawson & Beckett, 2021). These include, for example, the social model, the economic model, the minority group model, the Nordic relational model, the affirmative model of disability, the cultural model of disability, the biopsychosocial model of disability, the human rights model of disability (Degener, 2016; Lawson & Beckett, 2021). All these models attempt to understand, and sometimes explain or define what is meant by "disability" (Degener, 2016).

Degener (2016) asserted that the most significant models of disability in the English-speaking world have been the medical and social model of disability, developed by scholars of disability studies during the 1970s and 1980s in the UK and the USA. With the adoption of the UNCRPD in 2006 (UN, 2006), a new model emerged – the human rights model of disability (Degener, 2016). These three models are explored briefly in the following paragraphs as they pertain to the built environment and UD, and subsequently, this thesis.

The medical model

The medical model regards disability as a problem of the individual that is directly caused by a disease, an injury, or other health conditions, and requires prevention

interventions or medical care, from helping and medical disciplines, in the form of treatment and rehabilitation (Degener, 2016; Mitra, 2018). Disability is considered a deviation from the normal health status (Degener, 2016), or to put it simply, people are disabled because of being unable to function as a 'normal' person does (Mitra, 2018). Exclusion of persons with disabilities from society is regarded as an individual problem with the reasons for exclusion seen in the impairment (Degener, 2016); thus, medical rehabilitation is considered to play an important role in bringing the person back or close to the norm (Mitra, 2018).

Over many years international human rights instruments (e.g., UNCRC), laws, and policies adopted the medical model of disability (Moloney et al., 2021). Subsequently, deeply entrenched ways of thinking by the medical model of disability have had a profound influence on the shaping, forming, and making, of built environments (Jackson, 2018). While it is highly unlikely that built environment professionals set out to deliberately design-out 'the disabled', the result of their exclusionary 'othering' actions is the same: a built environment that ignores the needs of many people with a disability (Jackson, 2018).

However, a significant criticism of the medical model is that the medical model leads to paternalism, pathologisation, and benevolence (Goodley, 2016). Moreover, the medical model has been highly criticised by persons with disabilities; their view posits that disability is not their impairments but the societal factors that restrict disabled people, including prejudice and discrimination (McTigue, 2015). Therefore, the social model was developed as a critique to the medical model of disability (Degener, 2017).

The social model

The social model was developed as a critique to the medical model of disability (Degener, 2017; Oliver, 1990). Michael Oliver, a British academic and disability activist, developed the social model of disability in 1983 following the publication of the Fundamental Principles of Disability document in the mid-1970s (Union of Physically Impaired Against Segregation, 1972), which argued that we were not disabled by our impairments but by the disabling barriers we faced in society" (Oliver, 2013, p. 1024). In stark contrast to the medical model, a social understanding of

disability explains disability from the perspective of the disabling environmental barriers; disability is expressed as oppression and barriers in the social and material environment (Dirth & Branscombe, 2017; Hughes & Paterson, 1997; Lawson & Beckett, 2021; Shakespeare, 2006; Smart & Smart, 2006). As such, the social model shifts the onus of response away from the individual (to be cured) to society (to dismantle barriers that construct disability) (Degener, 2016; Dirth & Branscombe, 2017; Jackson, 2018).

Nonetheless, the social model has almost been as strongly criticised as the medical model (Degener, 2017). For example, Lid (2014) asserted that the social model gives little room for recognising people as individual embodied persons that experience barriers differently, and thus, is "less qualified as a knowledge base for UD" because understanding UD concerns understanding barriers and accessibility from individual perspectives (p. 1345). While an array of alternatives to the social model have emerged over the past three decades, the UNCRPD (UN, 2006) offers one such alternative – the human rights model (Lawson & Beckett, 2021).

The human rights model

In the context of human rights law and policy, the human rights model has gained prominence and considerable influence, since the adoption of the UNCRPD in 2006 (Degener, 2016; Lawson & Beckett, 2021). The purpose of the UNCRPD is "to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity" (UN, 2006, Article 1). It consists of 50 separate articles; Articles 5 to 30 set out the fundamental rights protected by the UNCRPD, while the remaining provisions determine mechanisms for implementation and monitoring (Series, 2019). Significantly, the themes of equality and non-discrimination run through the UNCRPD in what Waddington (2011) describes as "like a red thread" (p. 436).

While the social model argued that society disabled people due to its constructs and design (Lawson & Priestley, 2016), the human rights model is a forceful reminder of the rights of people with disability, as epitomised by the Convention (Jackson, 2018). Also, the human rights model builds on the social model of disability to provide a

more comprehensive solution to the issues faced by persons with disabilities (Degener, 2016). The UNCRPD (UN, 2006) has been widely hailed by scholars and activists as a "paradigm shift" in approaches to disability and to human rights (Kanter, 2006; Kayess & French, 2008; Lawson, 2006; MacKay, 2006). The language of a "paradigm shift" has been used to convey that the existing paradigm of human rights instruments has been ineffective for persons with disabilities, and to determine what is required – i.e., a fundamental shift in the underlying epistemologies and norms of existing human rights instruments (Series, 2019).

The UNCRPD's epistemological and normative break with what came before is signalled in its preamble (Series, 2019). The preamble of the UNCRPD disability is described as relational (Lid, 2014): "disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders full participation in society on an equal basis with others" (UN, 2006, e). The relation involves a person – environment interaction (between the individual and the social, cultural, and physical environment) motivated by the person's right to activity, participation, and citizenship (Lid, 2014). Thus, given that UD is a complex topic that involves a concept of person, the environment, and the interaction (Iwarsson & Ståhl, 2003), such a relational model is coherent with UD as it recognises disability as a complex person – environment interplay.

Moreover, in its various explicit and implicit references, the Convention effectively requires all the built environment to be accessible, usable, and inclusive of all. Therefore, the human rights model of disability, via the UNCRPD (UN, 2006), offers insight into the imperative for providing accessible, usable, and inclusive public playgrounds. Furthermore, Series (2019) emphasised that the benchmark against which successful implementation of the UNCRPD will be measured is the extent to which people with disabilities enjoy equal rights in comparison with others in their society. Thus, and to apply a rights-based analysis to the barriers to the realisation of the rights of children with disabilities and their families, this thesis applies the human rights-based approach to disability.

Conclusion

To sum up, public playgrounds are important environments for outdoor play, social participation, and inclusion in many contexts around the world. However, many children and their families are not afforded equal opportunities to leverage from the benefits of participating in public playgrounds because of physical barriers to access and social barriers to participation. Still, the denial of occupational rights (in this case, play rights) "constitutes an occupational injustice" (Hammell, 2020, p. 389). Moreover, the right to play and access the physical environments (including play environments) is enshrined in international legislative documents (UN, 1989; UN, 2006).

However, problems in implementing these rights led to the publications of GC17 on play and leisure (CRC, 2013) and GC2 on accessibility (CRPD, 2014). While varied concepts and methods to address non-discriminatory planning and design for playgrounds, including for example accessibility, usability, inclusive design, barrier-free design, and design for all (e.g., Burke, 2013; Lynch, Moore, et al., 2018; Moore & Lynch, 2015; Prellwitz & Skär, 2007; Prellwitz & Tamm, 1999; Prellwitz et al., 2001; Stanton-Chapman & Schmidt, 2016, 2017a, 2018; Woolley, 2013), both General Comments (CRC, 2013; CRPD, 2014) endorse UD for providing conceptual guidance for designing environments that are accessible, usable, and inclusive of all. More recently, the new European Standard EN 17210:2021 *Accessibility and usability of the built environment – Functional requirements* endorses UD for public playground design. Also in Ireland, the context in which this study was undertaken, the new draft legislation currently before the Irish Government – *Community Participation (Disability) (Miscellaneous Provisions) Bill* (2019) – specifically requires local authorities to build inclusive public playgrounds. Consequently, the use of UD for the design and provision of public playgrounds that support outdoor play, social participation, and inclusion is being promoted internationally, primarily at a conceptual or theoretical level.

However, and despite intensified research efforts in recent years on how to design for play in public playgrounds, specifically from a human-rights and justice perspective, no work had yet been done to synthesise evidence for UD or analyse its use in more

detail for public playground design. Specifically, there was a lack of evidence concerning the use of UD for playground design at a higher conceptual level as well as an applied level. Therefore, this doctoral research aimed to address these knowledge gaps; specifically, this research was underpinned by a human/child rights-based approach and is also an occupational science study adopting a PEO model that considers play for the sake of play as fundamental to a good childhood, in the context of transactional understanding of how the fit between person and environment maximises the potential occupation of play that can happen in public playgrounds.

Aims of the thesis

The overarching aim of this thesis was to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level. Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD and includes five studies that employed multiple methods to review published and grey literature as well as explore the perspectives of "professional experts" and "user experts". To achieve the overall aim of the thesis, research aims were established for each of the five research studies that comprise this doctoral research; these were formulated as follows:

- To identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD (**Study I**).
- To examine how UD, and related non-discriminatory planning and design concepts, have been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion (**Study II**).
- To synthesise what is known from international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles, and design recommendations within these guidelines (**Study III**).
- To provide a comprehensive "first impression" of the ways in which UD is understood and implemented by a national sample of playground professionals (i.e., those that plan, design, and/or provide public playgrounds) in the Republic of Ireland (**Study IV**).

- To explore the experiences of using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD (**Study V**).

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Chapter Two: Methodology and Methods

Introduction

To extend knowledge on how to enable outdoor play, social participation, and inclusion in public playgrounds, the ambition of this thesis is to establish an evidence base for using Universal Design (UD) for public playground design. Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD from a higher conceptual level as well as an applied level. Specifically, the doctoral research comprised five studies that reviewed published and grey literature as well as explored the perspectives of "professional experts" and "user experts"; this chapter describes the design and implementation of these five studies.

First, the philosophical and theoretical considerations underlying the choice of design and research method is introduced briefly. Then, the study setting is introduced, followed by a detailed description of the study designs for the five studies. Next, the participants and criteria for selection for each of the studies is presented, as well as data collection and data analysis methods. Finally, ethical considerations that underpinned the studies are described before describing how validity was established. A critique of the study's methodology is provided as part of the discussion chapter.

Philosophical and theoretical considerations underlying the choice of design and research methods

Prior to commencing the research process, it is necessary first to consider the assumptions, ideas, and judgements that underlie the research, which are linked to the ontological and epistemological focus that sustains the research methods, alongside the judgements and beliefs of the researcher (e.g., Carpenter & Suto, 2008; Creswell, 2022; Creswell & Creswell, 2018; Creswell & Plano Clark, 2018; Creswell & Poth, 2018; Denzin & Lincoln, 2018; Ángel & Batista, 2020). However, before focusing on the philosophical foundations for this doctoral research, it is necessary to consider design research firstly to understand where this research fits within broader design and research agendas.

According to Friedman (2003), design research consists of six general areas, namely natural sciences, humanities and liberal arts, social and behavioural sciences, human professions and services, creative and applied arts as well as technology and engineering. Moreover, there are numerous ways to classify design research; these include for example: research in design (Curedale, 2013; Margolin, 2010; Visocky O'Grady & Visocky O'Grady, 2009), design studies (Margolin, 2010), research for design (Findeli et al., 2008; Frayling, 1993; Lenzholzer et al., 2016), research into, on, or about design (Findeli et al., 2008; Frayling, 1993; Jansson et al., 2019; Lenzholzer et al., 2016; Nijhuis & Bobbink, 2012), research through design (Barnett, 2000; Findeli et al., 2008; Frayling, 1993; Jansson et al., 2019; Koskinen et al., 2011; Lenzholzer et al., 2013; Nijhuis & Bobbink, 2012), lab, field, and showroom research (Koskinen et al., 2011), clinical, applied, and basic research (Buchanan, 2001), scholarly, pure, developmental, and applied research in the creative arts and design (Brown et al., 2004), endogenous and exogenous design research (Bonsiepe, 2012).

More recently, Miguel Ángel and Herrera Batista, suggested two different groups of design research: one group concentrating "on the professional practice of design", where the purpose is to improve products, services, or experiences, and the other group concentrating on "the generation of knowledge" focussed on a stronger understanding of design as a discipline and the strengthening of its theory (Ángel & Batista, 2020, p. 11). On this basis, Ángel and Batista (2020) determined that it is conceiveable to summarise design research through a symbolic equation in two alternative ways. The formula consists of Design (D) + Research (R) (Ángel & Batista, 2020, p. 21). The first variant of the formula is $D + R = P$, where the main result is a product (P) (Ángel & Batista, 2020). This expression represents the strengthening and improvement of the design process, and the main goal is "the realisation of a new product or the incorporation of improvements to an existing product" (Ángel & Batista, 2020, p. 22). The second variant of the formula is $D + R = K$, where the main result is knowledge of a better understanding of a specific phenomenon around the design discipline (K) (Ángel & Batista, 2020, p. 21). Here design is "regarded as an object of reflection and analysis"; the final result could include "the acquisition of new knowledge, the verification of an existing one, the development of new conceptual structures, or maybe the formulation of approaches for a better understanding of design" (Ángel &

Batista, 2020, p. 22). Certainly, this doctoral research aligns with the latter formula, given the ambition to establish an evidence base for using UD for public playground design.

In many ways, these formulas align with early writings by Christopher Frayling (1993) who wrote about the difference of Research and research offering designers and/or researchers a framework to clarify their intentions and outcomes; the 'big R' version describes the production of new knowledge (e.g., through a design activity), while the 'small r' includes a search through pre-existing knowledge (e.g., to support a design activity). Nevertheless, there have been recurring warnings that design research is facing distinct theoretical (Love, 2002), methodological (McMahon, 2012), and scientific challenges (Cash et al., 2016) that are affecting its impact and relevance. Certainly, discussion about what design research is or ought to be remains largely unresolved; recently, Ángel and Batista (2020) identified that debate has focused on two key aspects: the level of rigour that should prevail in design research and the need or not to develop one's own research methods.

Regarding research rigour, Philip Cash (2018) asserted that "increased rigour is needed to avoid stagnation, low impact and potential obsolescence" (p. 84). Moreover, Ángel and Batista (2020) confirmed that raising research standards both strengthens the chances of developing better products as well as adds to the development of an evidence-based design theory. Concerning the search for a methodology or method of research, Cash (2018) confirmed that understanding robust methods cannot be atheoretical. Moreover, Shah and Corley (2006) identified that rather than arguing the relative merits of qualitative versus quantitative methods assuming one method is better than the other, the focus should be on combining methods to provide rich understanding. Additionally, Ángel and Batista (2020) confirmed that research activity and design practice are both highly complex tasks and conclude that it is not possible to find a "universal and unique method capable of adjusting to all the needs and conditions required in each case" and concluded that it is not possible to find a single and general method for design research (p. 10).

Notwithstanding the challenges, Ángel and Batista (2020) acknowledge that it is possible and desirable to contribute to the debate about the epistemological and ontological foundations that underpin design research. They specifically suggested to find strategies to standardise and make the evaluation criteria in design research more efficient, it is necessary to define what research design means, how it should be understood, and how it should be developed (Ángel & Batista, 2020). They also highlighted that although design researchers use diverse methods and techniques widely used in other disciplines, they necessitated the need to move toward mixed approaches (Ángel & Batista, 2020). Furthermore, they articulated that design research includes both objective and subjective elements; therefore, paradigms (or worldviews) that point to an objective reality (such as positivism and post-positivism paradigms) and assume subjectivity as an important part of their reality (such as interpretative and constructionist paradigms) are not sufficiently broad or flexible to sustain design research (Ángel & Batista, 2020).

Consequently, Ángel and Batista (2020) asserted that design research "requires a philosophical approach capable of responding to its complex reality" and suggested that "pragmatism is an ideal option to guide design research" (p. 135). Indeed, other scholars have suggested pragmatism as an appropriate paradigm base for design research (e.g., Dalsgaard, 2014; Dixon, 2019, 2020; Melles, 2008; Servillo & Schreurs, 2013). Pragmatism includes a set of ideas that have been articulated over the years from historical scholars such as John Dewey, William James, and Charles Sanders Pierce, to contemporary scholars such as Cherryholmes (1992), Murphy and Murphy (1990), and Morgan (2007).

According to Creswell and Plano Clark (2018) pragmatism "draws on many ideas, including employing "what works", using diverse approaches, and valuing both objective and subjective knowledge" (p. 39). Moreover, Creswell and Creswell (2018) asserted that pragmatism applies to mixed methods research as researchers can draw from qualitative and quantitative assumptions. Additionally, Creswell and Poth (2018) emphasised that researchers using this worldview use "multiple methods of data collection to best answer the research question, will employ multiple sources of data collection, will focus on the practical implications of the research, and will emphasise

the importance of conducting research that best addresses the research problem" (p. 27). They further articulated that researchers using a pragmatic worldview "are "free" to choose the methods, techniques, and procedures of research that best meet their needs and purposes" (Creswell & Poth, 2018, p. 27).

In addition to the philosophical foundations for mixed methods research studies, it is also necessary to consider the theories that underpinned the research. While multiple theories can underpin mixed methods research such as "feminist theories, social economic theories, disability theories, racial or ethnic theories, leadership theories, behavioural theories, or adaptation theories" (Creswell, 2022, p. 31), in the context of this doctoral research, it is important to consider theory as it pertains to UD. As prefaced in the introductory chapter, key concepts underpinned this doctoral research; they were, play occupation, the Person-Environment-Occupation (PEO) model (Law et al., 1996), a human/child rights-based approach, and UD; however, in the context of UD, several theoretical influences shape UD (D'Souza, 2004; Pullin, 2009; Tobias, 2003). D'Souza (2004) describes UD as consisting of an eclectic range of theories, and thus, is not dominated by any particular theoretical tradition.

In particular, D'Souza (2004) asserts that this eclectic range comprises the positivist predisposal of UD towards the proliferation of principles, its normative prescription of guidelines on what good design is or ought to be, and its instrumental and pragmatic character in attempting to influence the usefulness of designed artefacts. Further, UD focusses on issues of social inclusion (Imrie, 2012). Consequently, Imrie (2012) emphasised that these different strands of theory provide UD with, potentially, the flexibility to investigate, and interpret, the relationships between person and environment factors in numerous ways. Indeed, Imrie (2012) confirmed that although professionals may have different disciplinary backgrounds, they are linked by a shared set of beliefs, and a commitment to the deployment of evidence as part of a process to reach consensus on what UD is or ought to be.

As noted, this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD from a higher conceptual level as well as an applied level. Therefore, in keeping with the ontological traditions of design

research, overall, this doctoral research employed a non-sequential multi-method design underpinned by a pragmatism research philosophy. Corresponding to this worldview, the choice of design and research methods for the five studies that comprise this doctoral research were not committed to any one system of philosophy and reality; rather, the choice of study designs and research methods were carefully selected to best meet the needs and purposes of the respective studies.

Overall, the five studies addressed macro (review of conceptual understandings of UD), meso (review of academic and grey literature evidence for using UD) and micro (perspectives of "professional experts" and "user experts") levels in the quest to establish an evidence base for using UD. Moreover, and as previously noted, this research is underpinned by a human/child rights-based approach and is also an occupational science study adopting a PEO model that considers play for the sake of play as fundamental to a good childhood, in the context of transactional understanding of how the fit between person and environment maximises the potential occupation of play that can happen in public playgrounds.

Setting

Ireland is a country consisting of thirty-two counties across two states – Northern Ireland and the Republic of Ireland. The Republic of Ireland occupies twenty-six of the thirty-two counties, divided over four provinces – Munster, Leinster, Connacht, and Ulster (Figure 1).

The first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) studies included scoping review methods; therefore, academic, and grey literature from international contexts were included. The first empirical study with "professional experts" (**Study IV, Paper IV**) was conducted with a national sample of playground professionals in the Republic of Ireland; thus, participants were recruited from all four provinces. The second empirical study with "user experts" (**Study V, Paper V**) was conducted with five family units (14 participants in total) living in the Munster, Leinster, and Connacht (spelt as Connaught also) provinces of the Republic of Ireland.



Figure 1: Map of Ireland (thirty-two counties and four provinces)

Study designs

As previously noted, the overarching aim of this thesis was to establish an evidence base for using UD for public playground design. Despite intensified efforts in recent years on how to design for play in public playgrounds, no work had yet been done to synthesise evidence for UD or analyse its use in more detail for public playground design. Specifically, there was a lack of evidence concerning the use of UD for

playground design at a higher conceptual level as well as an applied level. Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD from a higher conceptual level as well as an applied level.

In sum, the doctoral research comprised five studies that reviewed published and grey literature as well as explored the perspectives of "professional experts" and "user experts" (Figure 2). To achieve the overall aim of this thesis, research aims were established for each of the five research studies that comprise this doctoral research. Therefore, different designs were chosen to realise the respective aims of each of the five studies. Moreover, an emergent design was employed, to be able to answer the issues addressed in this thesis and mature the research questions from emerging findings to reach a more profound understanding of the focus of inquiry.

Specifically, Studies I, II and III, included scoping review studies. While scoping review studies can be conducted to determine the value and probable scope of a systematic review, they can also be conducted as exercises in and of themselves to summarise and disseminate research findings, to identify research gaps, and to make recommendations for future research (Arksey & O'Malley, 2005; Peters et al., 2015). Researchers have determined that scoping reviews are invaluable for synthesising research evidence (Arksey & O'Malley, 2005; Pollock et al., 2021), especially when a body of literature has not yet been comprehensively reviewed, or exhibits a large, complex, or heterogeneous nature not amenable to a more precise systematic review (Peters et al., 2015).

As previously established, evidence on playground design for inclusion is only emerging. Nevertheless, the overall aim of this thesis was to establish an evidence base for using UD for public playground design. Therefore, scoping reviews were deemed appropriate for studies I, II and III as they explored evidence from a higher conceptual level as well as an applied level, in response to specific knowledge gaps (described below). Overall, these scoping review studies sought to examine broad areas, identify gaps in the research knowledge base, clarify key concepts, and report on the types of

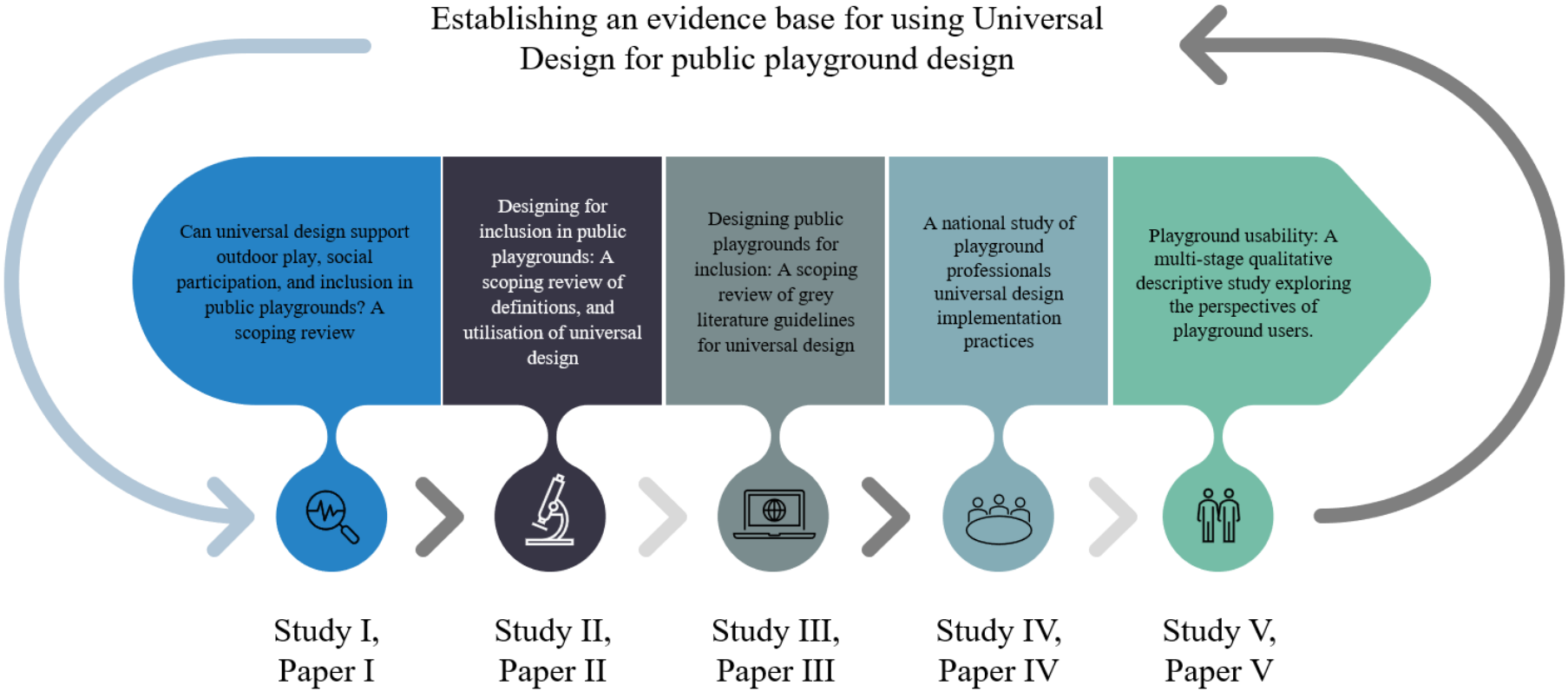


Figure 2: Five studies that comprise this thesis

evidence that addresses and inform practice in the field. Each of the studies are described below. Further rationale for three scoping review studies is provided in Chapter Nine.

The first study (**Study I, Paper I**) aimed to review evidence for using UD in public playground design. As previously noted, some effort had been made in recent years to study the research evidence for public playground design for inclusion in the public realm (Alsarawi, 2020; Brown et al., 2021; Burke, 2013; Casey, 2017; Fernelius & Christensen, 2017; Moore & Lynch, 2015; Prellwitz & Lynch, 2018; van Engelen et al., 2021); however, no work had yet been done to identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD. Therefore, this study aimed to address this knowledge gap; specifically, a scoping review of peer reviewed published literature was undertaken to identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD. This design was deemed most suited as scoping reviews seek to map the extent, range, and nature of a body of literature that has not been reviewed extensively or exhibits a large, complex, or heterogeneous nature not amenable to a more precise systematic review (Arksey & O'Malley, 2005; Peters et al., 2015; Pham et al., 2014). Therefore, because peer reviewed literature on inclusive public playground design is emergent, a scoping review was deemed appropriate.

The second study (**Study II, Paper II**) aimed to review the conceptual understanding of UD in public playground design. As previously noted, the use UD for public playground design for inclusion is being promoted internationally, primarily at a conceptual or theoretical level; however, no work had yet been done to examine how UD, and related non-discriminatory planning and design concepts, had been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion. Moreover, emergent findings from the first scoping review study (**Study I, Paper I**) revealed that numerous non-discriminatory planning and design concepts are used in peer reviewed studies exploring public playground design for inclusion, and concluded that clearer delineation from, or indeed the

relationship between, related concepts is needed. Therefore, to address this knowledge gap, and achieve the aim of this study, a scoping review of peer reviewed published literature (which comprised of the literature identified for Study I) was conducted to carefully examine how UD, and related concepts, are represented in the current discourse around designing for outdoor play, social participation, and inclusion in public playgrounds. Like Study I, peer reviewed literature on inclusive public playground design is emergent, therefore, a scoping review was necessitated to synthesise the emerging literature.

The third study (**Study III, Paper III**) aimed to synthesise what is known from international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles, and design recommendations within these guidelines. As noted, some efforts had been made in recent years to study the research evidence for public playground design for inclusion in the public realm (Alsarawi, 2020; Brown et al., 2021; Burke, 2013; Casey, 2017; Fernelius & Christensen, 2017; Moore & Lynch, 2015; Prellwitz & Lynch, 2018; van Engelen et al., 2021) and to assemble information from guideline documents (Kim et al., 2018; Lynch et al., 2019; Lynch, Moore, et al., 2018; Olsen, 2015); however, no work had yet been done to systematically synthesise what is known from international grey literature for the design of inclusive public playgrounds. Therefore, this study aimed to address this knowledge gap.

Specifically, scoping review search methods were developed and applied to conduct a review of grey literature pertinent to guidelines for the design of public playgrounds for inclusion. Although scoping reviews typically comprise a review of published and grey literature on a given topic (Arksey & O'Malley, 2005; Levac et al., 2010; Peterson et al., 2017) a scoping review of grey literature exclusively was selected because the evidence base for using UD was so under-developed. As such, a different form of knowledge (practitioner experience) could be located within guideline documents and therefore practice knowledge rather than research knowledge would be found. Moreover, the first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping studies had already synthesised the academic literature, therefore, a review of grey literature

would provide a more complete review of all available evidence on designing public playgrounds for inclusion.

Collectively the three scoping review studies laid the foundation for the two empirical studies that followed; these empirical studies sought to provide new data from the perspectives of "professional experts" and "user experts", in response to knowledge gaps. For the first empirical study with "professional experts" a cross-sectional survey was employed. For the second empirical study with "user experts" a qualitative descriptive design was utilised to describe the experiences of public playground use/ non-use from child and adult perspectives, and to generate ideas that would improve the inclusivity of public playgrounds in future development and provision efforts. These studies are described below with further rationale for the choice of design.

Indeed, the first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping review studies identified a need to extend knowledge on UD as it applies explicitly to public playgrounds. Moreover, the third scoping review study (**Study III, Paper III**) asserted that further research with public playground "creators" was required to overcome inequalities faced by diverse users and strengthen the knowledge base on using UD for public playground design from a higher conceptual level as well as an applied level. Also, as previously noted, while efforts had been made in recent years to explore the perspectives of municipality representatives (Lynch et al., 2019, 2020; Prellwitz & Tamm, 1999; Prellwitz et al., 2001; Sterman et al., 2019; Van Melik & Althuizen, 2022), no work had yet been done to explore the ways in which UD is understood and implemented by a national sample of playground professionals (i.e., those that plan, design, and/or provide public playgrounds) in the Republic of Ireland.

Therefore, in response to this knowledge gap, the overall aim of this thesis, and informed by emergent findings from the three scoping review studies, the first empirical study (**Study IV, Paper IV**) aimed to explore the perspectives of "professional experts". Specifically, this study aimed to provide a comprehensive "first impression" of the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland. To achieve this aim, a descriptive, cross-sectional online survey was used to explore the ways in which UD is understood and implemented. As this study aimed to provide a

comprehensive "first impression", a cross-sectional survey was deemed most applicable as it collects data about a population (in this case, playground professionals) at a particular point in time (Connelly, 2016; Hall & Lavrakas, 2008). Moreover, an electronic survey was chosen because of their usefulness in "examining phenomena that can be assessed through self-observation, such as attitudes and beliefs" (Portney & Watkins, 2015, p. 326), and online surveys are associated with higher rates of participation when targeting professional groups (Bourque & Fielder, 2003). Further rationale for the choice of design for this study can be found in Chapter Six.

Furthermore, as noted, the first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping review studies identified a need to extend knowledge on UD as it applies explicitly to public playgrounds. Moreover, the third scoping review study (**Study III, Paper III**) asserted that further research with public playground "users" was required to overcome inequalities faced by diverse public playground users and strengthen the knowledge base on using UD for public playground design from a higher conceptual level as well as an applied level. Additionally, as noted, some efforts had been made in recent years to explore user perspectives in the context of playground design for inclusion (Bhuyan, 2022; Black & Ollerton, 2022; Hill & Chawla, 2019; Lynch et al., 2020; Olsen & Dieser, 2012; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Stanton-Chapman & Schmidt, 2016, 2017, 2018, 2019; Sterman et al., 2019; Wenger et al., 2021), however, no work had yet been done to determine the opportunities and barriers for diverse users and/or non-users to enjoy their rights to outdoor play, social participation, and inclusion in public playgrounds.

Therefore, responding to this knowledge gap, the overall aim of this thesis, and informed by emergent findings from the third scoping review study that established the need for further research with "user experts", this second empirical study (**Study V, Paper V**) aimed to explore the experiences using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD. To realise this aim, a qualitative descriptive design was applied to describe the experiences of public playground use/ non-use from child and adult perspectives, and to generate ideas that would improve the inclusivity of public playgrounds in future development and provision efforts (Sandelowski, 2000, 2010).

This design was deemed most suited as it is particularly relevant for exploring phenomena that are not well understood and enables the attainment of comprehensive insights from the perspectives of those who have experienced the phenomena first-hand (Kim et al., 2017; Sandelowski, 2010). Further rationale for the choice of design for this study can be found in Chapter Seven.

Participants and criteria for selection

The selection of study participants was done by using different inclusion criteria, depending on the aim of each study that comprise this doctoral research. Of note, in the case of the three scoping review studies, participants refer to peer-reviewed academic papers (Study I and Study II) or grey literature guideline documents (Study III).

Figure 3 shows an overview of the number of participants for each of the five studies; the criteria for selecting participants and further demographic information for the included participants is described below.

For the first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping review studies, the PhD candidate consulted an expert librarian for guidance on searching the literature. Following this, a defined search strategy, combining playground terms and non-discriminatory planning and design terms, was identified (Table 1). Eleven electronic databases were searched in November 2019 (Academic Search Complete, CINAHL, Education, ERIC, MEDLINE, PsycINFO, SocINDEX, SPORTDiscus, Scopus, Web of Science, PubMed), and reference lists of key studies were hand searched, for additional relevant studies. These searches yielded 102 potentially relevant studies; however, to be eligible for inclusion, specific criteria needed to be realised (Table 1). Overall, 15 peer reviewed journal articles published between 1999 and 2019 met the inclusion criteria for the first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping review studies.

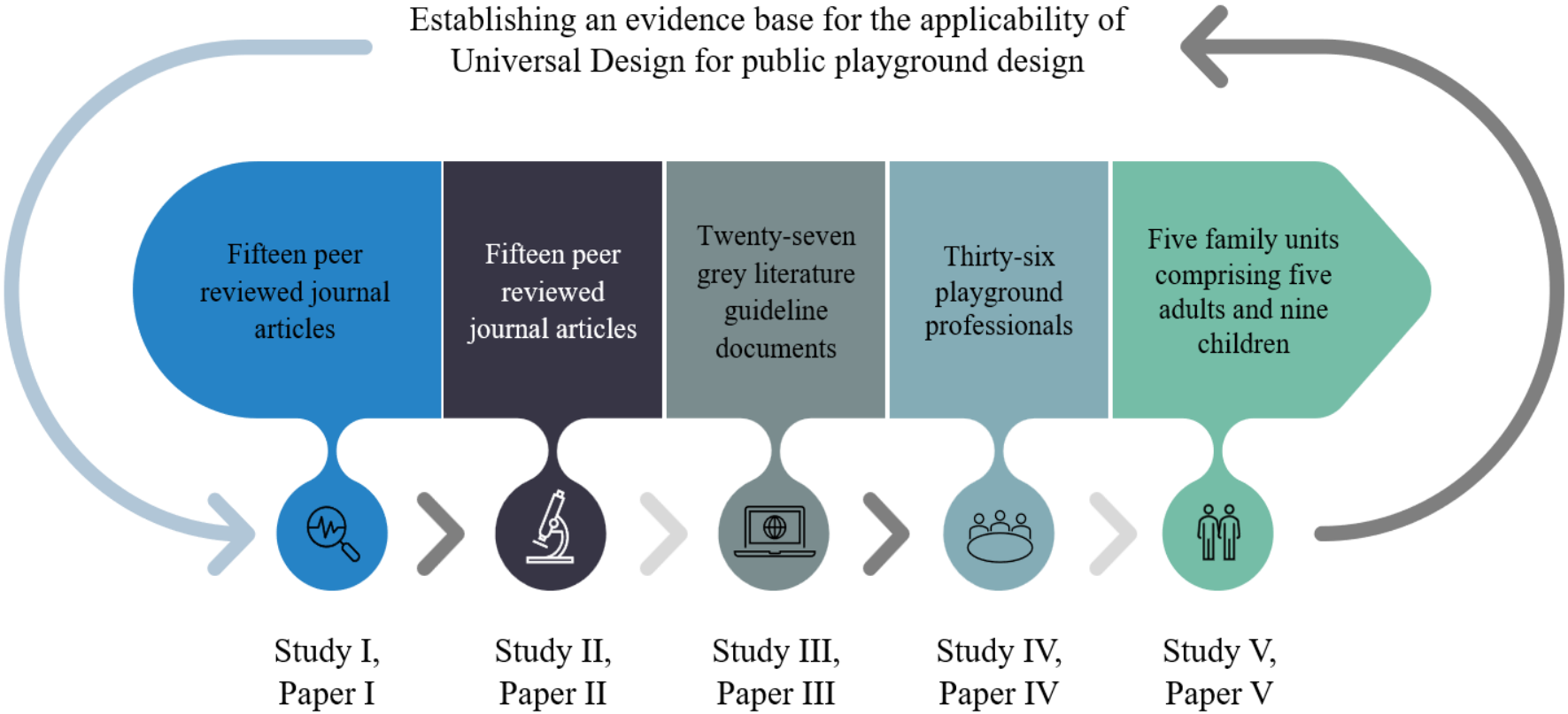


Figure 3: Participants in Studies I – V

Table 1: Search terms and inclusion criteria for Studies I and II

Search terms	(playground* OR "play space*" OR playspace* OR "outdoor play space*" OR "outdoor play environment*") AND (universal* design* OR "barrier free design*" OR "design* for all" OR "building* for everyone" OR "access* design" OR "inclus* design*" OR "architect* access*")
Inclusion criteria	Focus on playgrounds intended for public use; focus on non-discriminatory planning and design processes for built environments with the aim of promoting inclusion; written in English; published in peer reviewed journals; and available in full text.

The Internet is frequently used as a platform for publishing grey literature by varied organisations (Benzies et al., 2006), therefore, for the third scoping review study (**Study III, Paper III**), an electronic search of Google search engines, using a defined search strategy (Table 2), was completed to identify guideline documents for designing public playgrounds for inclusion. The same guidance provided by the librarian for Studies I and II applied to this study also, but instead of academic literature, the focus was on grey literature guideline documents. The search was initially completed in in November 2019, and subsequently updated in June 2020. The search generated 106 potentially eligible records; however, to be eligible for inclusion guideline documents needed meet specific inclusion criteria (Table 2). Inclusion criteria were achieved for 27 guideline documents of the 106 screened sources.

Table 2: Search terms and inclusion criteria for Study III

Search terms	(playground OR playspace OR 'play space') AND (guide* OR 'design guide*') AND (design* OR access* OR inclus* OR 'Universal Design')
Inclusion criteria	Focus on designing public playgrounds for inclusion; translate to other contexts (i.e., not about compliance with country specific standards/ laws); available free of charge; and available in English language.

To be eligible for inclusion in the first empirical study (**Study IV, Paper IV**) comprising a descriptive cross-sectional survey with "professional experts",

participants needed to come from any profession involved in planning, designing and/or providing public playgrounds in the Republic of Ireland. Purposive and snowball sampling techniques were used to recruit playground professionals. Recruitment email invitations, with a link to the questionnaire, were sent to sixty groups responsible for playground planning, design, and provision (Table 3). Moreover, a gatekeeper responsible for the Local Authority Play and Recreation Network (LAPRN) distributed the survey to LAPRN members which comprises of key local authority staff responsible for the local delivery of play and recreation services (including public playgrounds).

Table 3: Sixty groups contacted for sampling in the Republic of Ireland[53]

Groups	***n***
Local authorities	31
Playground suppliers	14
Institutes for architects, landscape architects, planners, and designers	4
Housing councils and associations	4
Forestry organisation	1
Government departments	3
Play organisations responsible for the promotion of children's play	2
Playground safety organisation	1

Also, eleven individual playground professionals were contacted directly. Snowball sampling was encouraged; thus, potential participants were contacted directly by the researcher or via gatekeeper(s). From the outset, potential participants were notified that by completing and submitting the survey they were consenting to participate in the study. A combined thirty-six playground professionals from all provinces in the Republic of Ireland completed the survey. Given the multiple routes to distributing the survey, it was not possible to determine a response rate. Also, because this survey was anonymous, it was not possible to determine what route respondents were recruited from. Furthermore, no information was obtained regarding non-responders.

[53] Table published in: Moore, A., Lynch, H., & Boyle, B. (2022). A national study of playground professionals universal design implementation practices. *Landscape Research, 47*(5), 611-627. https://doi.org/10.1080/01426397.2022.2058478

For the second empirical study (**Study V, Paper V**) with "user experts", to be eligible for inclusion in this 3-stage qualitative descriptive study, family units (referred to hereafter as families) needed to: (a) consist of a minimum of one adult (parent/ legal guardian) and one child (aged 0 – 18 years), (b) provide active consent (adult participants) and assent (child participants), and (c) be able to participate in all three stages of data collection. Purposive and convenience sampling techniques were used to recruit families, with and without disabilities, that use and/or do not use public playgrounds. In all instances, potential participants were contacted by one of three gatekeepers (Table 4) who offered information on what the study was about and who was conducting it. If potential participants were happy to be contacted by the PhD candidate, the gatekeeper forwarded their contact details (email and/or phone) for the PhD candidate to make contact.

Table 4: Gatekeepers that supported recruitment of family units in the Republic of Ireland

Gatekeeper role	**Number of family units recruited**
Head of services (disability organisation)	One (one parent and one child)
Parent and occupational therapist	Three (three parents and seven children)
Parent and primary school teacher	One (one parent and one child)

Once the PhD candidate made initial contact with potential participants, the PhD candidate provided potential participants with information about the study, including a request for their participation, whereupon those who agreed to participate returned a letter of informed consent (adult participants for their own participation and the participation of their children) and assent (child participants) forms to the PhD candidate prior to data collection. A combined five families, including five adults and nine children, from the Munster, Leinster, and Connacht provinces in the Republic of Ireland consented and assented to participate in the study. The adult participants comprised of four mothers and one father, while the child participants included five girls and four boys aged between three and thirteen years (Table 5).

Table 5: Participants for Study V

	Participant	Pseudonym	Residence
Family 1	Parent (Mother)	Rose	Suburban (Munster)
	Child (age 6; wheelchair user)	Alfie	
Family 2	Parent (Father)	Oliver	Suburban (Leinster)
	Child (age 10 [age 11 for focus grp]; female)	Amy	
	Child (age 9; female)	Molly	
Family 3	Parent (Mother)	Katie	Urban (Leinster)
	Child (age 7; male)	Harry	
	Child (age 5; male)	Jacob	
Family 4	Parent (Mother)	Anna	Rural (Connacht)
	Child (age 3; female)	Poppy	
Family 5	Parent (Mother)	Emily	Urban (Leinster)
	Child (age 13; female)	Hannah	
	Child (age 11; female)	Lucy	
	Child (age 11; male)	Noah	

Data collection methods

As different research designs were chosen for the studies that comprise this doctoral research, different data collection methods were utilised. The first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) studies utilised scoping review data collection methods. Moreover, the first empirical study (**Study IV, Paper IV**) with "professional experts" employed survey methods, while the second empirical study with "user experts" (**Study V, Paper V**) used three stages of data collection. Data collection methods across these three stages included survey methods (stage one), creative artistic approaches (stage two), and semi-structured interview (stage three) methods. Figure 4 illustrates an overview of the data collection methods for each of the five studies; the methods are also described below.

Scoping review method

For the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) studies, an established framework for conducting scoping review studies,

originally described by Arksey and O' Malley (2005), was employed. For all three studies, five stages of the framework were completed (i.e., identifying the research question, identifying relevant studies, study selection, charting the data, and collating, summarizing, and reporting the results); the non-compulsory "consultation exercise" was not performed. Moreover, to respond to criticisms targeted towards the robustness of scoping reviews as methodological approach for synthesising evidence (e.g., Davis et al., 2009; Tricco et al., 2016), further recommendations to ensure robustness were followed. Specifically, methodological intricacies recommended by the Joanna Briggs Institute (Peters et al., 2015) and other researchers (Levac et al., 2010) were followed as they pertained to each element required in a scoping review (e.g., developing research objectives and questions to provide direction and coherence for the scoping review; developing eligibility criteria related to the research objectives and questions; searching the evidence to identify all relevant evidence; selecting the evidence based on eligibility criteria; extracting the evidence using an extraction form; descriptively analysing the evidence to map and summarise available evidence; presenting results using visual representations (figures and tables) as well as narrative descriptions; summarising the evidence in the discussion and concluding sections).

The first (**Study I, Paper I**) and second (**Study II, Paper II**) scoping review studies included published academic literature, while the third (**Study III, Paper III**) scoping review study included grey literature exclusively to provide a more complete review of all available evidence on designing public playgrounds for inclusion. Each of the stages are described in the respective chapters for each of the scoping review studies (see Chapters Three, Four, and Five).

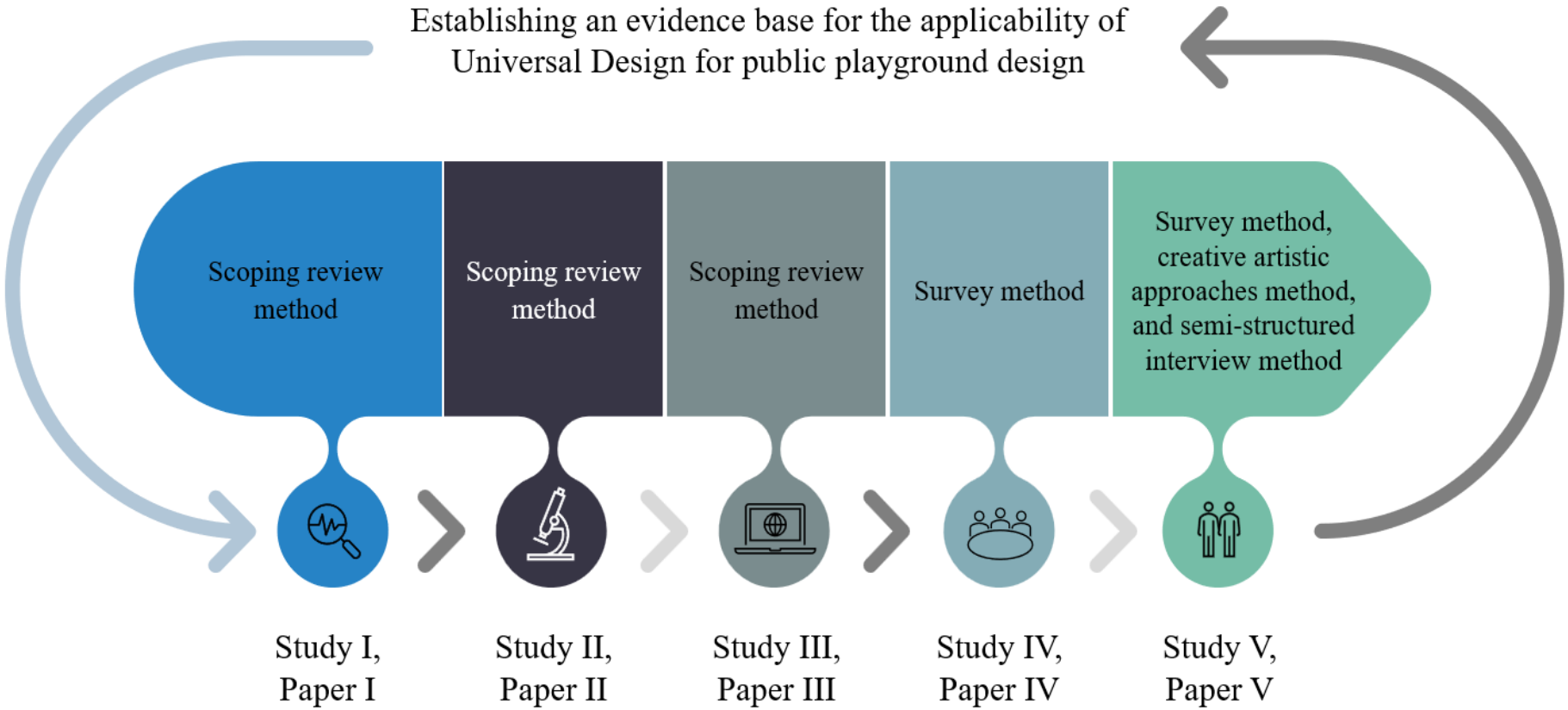


Figure 4: Data collection methods for Studies I – V

Survey method

For the empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**), data were generated through online surveys. The first empirical study with "professional experts" (**Study IV, Paper IV**) employed survey methods exclusively. As noted, the second empirical study with "user experts" (**Study V, Paper V**) used survey methods in combination with other data collection methods.

For the empirical study with "professional experts" (**Study IV, Paper IV**), a bespoke twenty-six item questionnaire was hosted on Google Forms to capture the required information at a national level. The items in the questionnaire were informed by the scoping review studies (Studies I – III) and further informed by expert knowledge – specifically, the draft questionnaire was reviewed by two UD experts, from the Centre for Excellence in UD in Ireland, and amendments were subsequently made (i.e., addition and removal of items, text simplification, and rephrasing of questions for clarity). Following these amendments, the revised questionnaire was pilot tested with four professionals with expertise on the design of built environments to identify possible operational errors. The final twenty-six item questionnaire (Appendix C), consisting of fifteen quantitative and eleven qualitative items, was hosted on Google Forms to capture the required information at a national level, and was distributed to playground professionals either directly by the PhD candidate or via gatekeepers (Table 3) in April and May 2021, and data collected over a seven-week period. Overall, thirty-six playground professionals from all provinces in the Republic of Ireland completed the survey anonymously.

For the empirical study with "user experts" (**Study V, Paper V**), two bespoke questionnaires, one for adult participants (Appendix D) and one for child participants (Appendix E), were designed to capture children and adults' experiences of using and/or not using public playgrounds (stage one of data collection). Items for the questionnaire were informed by: the scoping review studies (Studies I – III); tools that the PhD candidate and her primary research supervisor (Dr Helen Lynch) had previously used in research studies with playground users and non-users (Lynch et al., 2019, 2020); and a framework developed by colleagues in New South Wales that includes three core principles Can I get there? Can I play? Can I stay? (New South

Wales [NSW] Government, 2019). Prior to data collection, the draft questionnaires were piloted with one adult and five children, to test for clarity and possible operational errors. Feedback from the pilot exercise meant that the questionnaire for children was simplified (i.e., text simplification). The final questionnaires (described in Table 6) were hosted on Google Forms to capture the required information and were distributed to families who agreed to participate, once their letters of informed consent and assent were returned via email to the PhD candidate. Data were collected between February and April 2022.

Table 6: Questionnaires for child and adult participants

	Child questionnaire	**Adult questionnaire**
Number of items	18-items	20-items
Number of items for playground users	15-items	17-items
Number of items for playground non-users	9-items	10-items
Quantitative items (closed questions)	9-items	10-items
Qualitative items (open-ended questions)	9-items	10-items

In sum, five adults completed the adults survey, and nine children completed the children's survey. The surveys were not anonymous; participants included their names in the survey, so that data could be matched to families across all three stages of data collection and follow-up questions could be asked at stage three of data collection (semi-structured interviews).

Creative artistic approaches method

For the empirical study with "user experts" (**Study V, Paper V**), data were also collected using creative artistic approaches (stage two of data collection). Following their participation in stage one of data collection (pre-interview online surveys), families were invited to design their dream (ideal) playground, at a time that was convenient to them. Specifically, families were invited to design their dream playground, through a medium of their choice (e.g., arts and crafts, drawings, written compositions, technology), to generate ideas that would improve the inclusivity of public playgrounds in future development and provision efforts. The PhD candidate

requested families to send pictures of their creations to her via email in advance of stage three of data collection (i.e., semi-structured interviews). Overall, six drawings and one 3D artwork creation were produced by the five families.

Semi-structured interview method

For the empirical study with "user experts" (**Study V, Paper V**), data were also generated through qualitative interviews (stage three of data collection). Specifically, stage three of data collection consisted of semi-structured online interviews with families to feedback on their experiences of participating in stages one (surveys) and two (creative exercise) of data collection. It was originally anticipated that in-person data collection would take place with families; however, the COVID-19 pandemic posed an unprecedented challenge for in-person data collection and fieldwork, and thus, an online format was deemed more appropriate.

Prior to data collection, the draft semi-structured interview guide was piloted with five children, to ensure that the questions were fit for purpose. Feedback from the pilot exercise meant that the draft guide was simplified (text simplification) and further questions were added to elicit pertinent information regarding playground use and non-use (Appendix F). Furthermore, the PhD candidate reviewed online survey responses and photographs of creations from stages one and two of data collection in advance of the interviews, to formulate a tailored semi-structured interview guide for each family. Thus, a semi-structured interview was used in each of the interviews; the PhD candidate sought clarification where required (from stage one) and families were asked to discuss their dream playground (from stage two) to generate ideas that would improve the inclusivity of public playgrounds in future development and provision efforts.

Overall, thirteen participants participated in the online semi-structured interviews between February and April 2022 (five interviews in total with five families); one child chose not to participate in this stage of data collection as he was "shy" (reported by mother). In total, 3.42 hours (204.59 minutes) of interviews were recorded; the length of interviews ranged from 29.27 minutes to 58.41 minutes, with the average duration being 40.92 minutes. These online interviews were hosted by the PhD

candidate on MS Teams. These online interviews were also recorded on MS Teams, and the MS Teams dictate tool was used. The PhD candidate checked all transcripts generated by the MS Teams dictate tool, and amendments were made as required to ensure that the interviews were transcribed verbatim. Additionally, the PhD candidate digitally audio-recorded all interviews in case of any data losses, and the PhD candidate captured field notes after each interview to document contextual information and additional ideas.

Data analysis methods

As different research designs were chosen for the studies that comprise this doctoral research, different data analysis methods were utilised. Specifically, the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies combined descriptive statistical analysis and thematic analysis methods. The first empirical study with "professional experts" (**Study IV, Paper IV**) combined descriptive statistical analysis and content analysis methods. The second empirical study with "user experts" (**Study V, Paper V**) employed content analysis methods. Figure 5 displays an overview of the data analysis methods for each of the five studies; the data analysis methods are described below.

Descriptive statistical analysis

For Studies I – V, the PhD candidate purposefully selected descriptive statistical analysis to describe, synthesise, and summarise the data quantitatively. Descriptive statistics are the numerical procedures and/or graphical techniques used to organise, present, and analyse data (Fisher & Marshall, 2009). Rather than drawing inferences based on probability theory, descriptive statistics are used to give a general summary about the sample being studied (Kaliyadan & Kulkarni, 2019). In sum, descriptive statistics were used to describe specific characteristics about the data sets (Studies I, II, and III) and to provide simple summaries about the sample and the measures (Studies IV and V); however, in all instances thematic analysis (Studies I, II, and III) and content analysis (Studies IV and V) supported the statistical analysis.

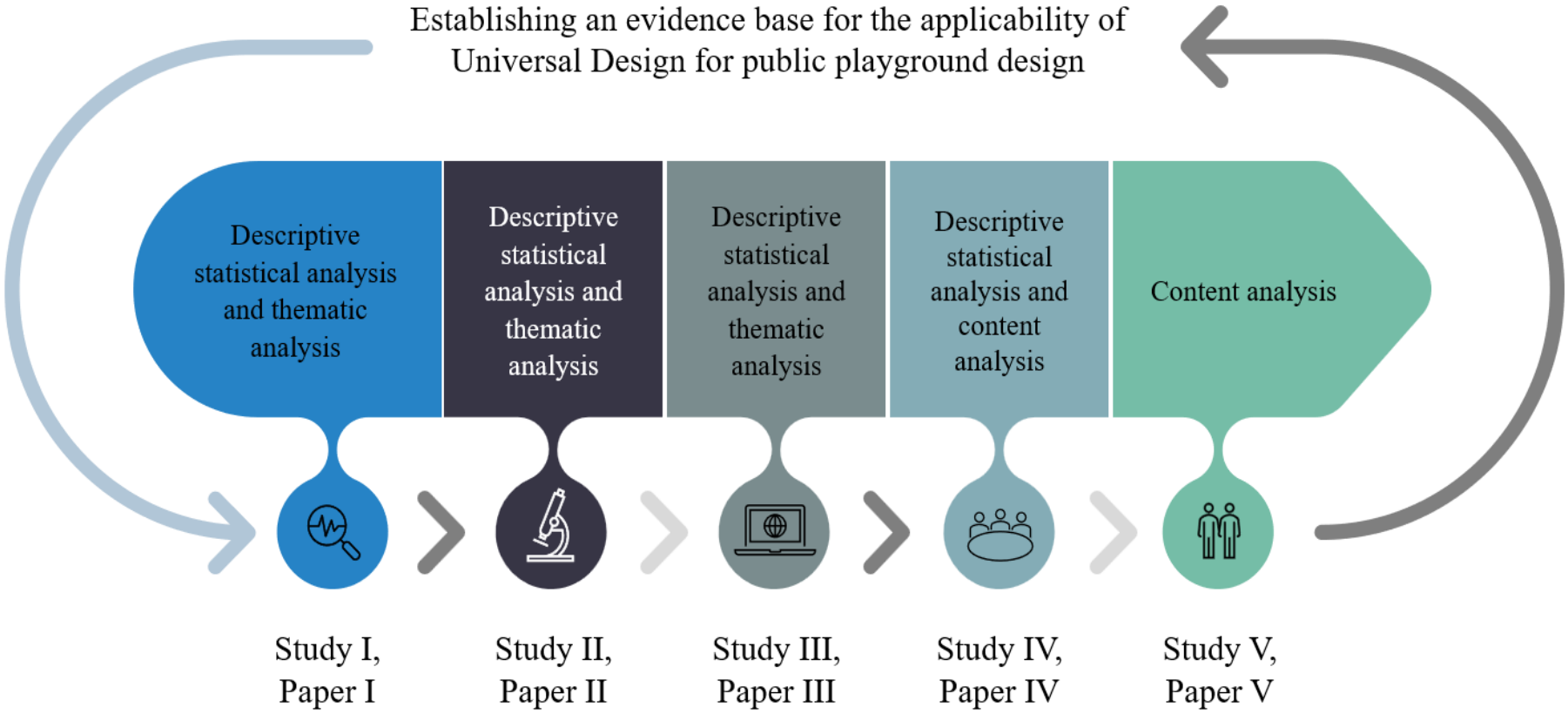


Figure 5: Data analysis methods for Studies I – V

In Studies I – V, all analyses were completed by the PhD candidate. Descriptive statistics were employed to quantify qualitative data for the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies to describe specific characteristics about the data sets. Moreover, for the empirical studies with "professional experts" (**Study IV, Paper IV**), descriptive statistics were used to provide simple summaries about the sample and the measures. Additionally, to establish validity for the analysis, the PhD candidate's supervisory team (namely, Dr Helen Lynch and Dr Bryan Boyle) independently reviewed all analyses for accuracy. The specifics for each of the studies is presented below and described in their corresponding chapters (see Chapters Three, Four, Five, and Six).

For the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies, descriptive statistical analyses were purposefully employed by the PhD candidate to summarise evidence characteristics for the included studies (Studies I and II) and guideline documents (Study III). Consistent with the aims of scoping review studies, this analysis focussed on mapping the extent, range, and nature of a body of literature (Arksey & O'Malley, 2005; Peters et al., 2015). Specifically, the descriptive statistical analyses provided insight into the extent, nature, and distribution of the included studies (Study I and II) and guideline documents (Study III). Data that was statistically analysed for the three scoping review studies is presented in Table 7. Moreover, summary tables and graphical representations of the data are provided in each of their respective chapters to illustrate and support the analysis (see Chapters Three, Four, and Five).

For the first empirical study with "professional experts" (**Study IV, Paper IV**), descriptive statistics were purposefully selected to describe, synthesise, and summarise the data for the fifteen quantitative items. Corresponding to the study aim, this analysis focussed on providing a comprehensive "first impression" of the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland. In particular, the descriptive statistical analysis provided simple summaries about the sample and data characteristics. Summary tables and graphical representations of the data are provided in the respective chapter to illustrate and support the analysis (see Chapter Six).

Table 7: Data statistically analysed for Studies I, II, and III

	Study I	Study II	Study III
Number published during the period included	●	●	●
Geographical location	●	●	●
Contribution made by disciplines	●	●	
Source organisation			●
Journals where studies were published		●	
Page length			●
Study designs	●	●	
Study populations	●		
Terminology		●	●
Contribution to themes and subthemes	●	●	●

Thematic analysis and reflexive thematic analysis

For the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies, thematic analysis was purposefully employed by the PhD candidate to identify, analyse, and report patterns (themes) within data (Braun & Clarke, 2006). This process was guided by Braun and Clarke (2006), who propose six phases for thematic analysis: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and reporting. These six steps have been reiterated in newer publications on thematic analysis also (e.g, Braun & Clarke, 2012, 2021; Clarke & Braun, 2013; Clarke et al., 2015).

Moreover, Braun and Clarke (2021) confirmed that although the six phases are organised in a sequential order, the researcher should be mindful that analysis is not a linear process of moving forward through the phases; rather, the analysis is iterative, requiring the researcher to move forward and backwards through the phases as required. Therefore, analysis for the studies was not seen as linear, but rather, iterative. Furthermore, following numerous efforts, by the original authors and other scholars, to further delineate their approach to thematic analysis (e.g., Braun & Clarke, 2019; Braun et al., 2014; Braun et al., 2016; Clarke & Braun, 2013; Clarke et al., 2015), this approach has more recently been referred to as reflexive thematic analysis. Reflexive thematic analysis came about in response to misconceptions about their 2006 approach

(Braun & Clarke, 2019); it highlights the researcher's active role in knowledge production – their subjectivity as an analytical resource, as well as their engagement with theory, data, and interpretation (Braun & Clarke, 2021). Consequently, the PhD candidate acknowledged her role and the role of her supervisory team (namely Dr Helen Lynch and Dr Bryan Boyle) in all analyses.

For all three scoping review studies, all analyses were conducted by the PhD candidate. The PhD candidate commenced the familiarisation phase by familiarising herself with the data through repeated rereading of studies/ guideline documents. To begin to organise the data and generate initial codes, line-by-line and/or paragraph-by-paragraph open coding was undertaken on all studies/ guideline documents. Following this, the PhD candidate grouped codes with similar meanings into categories. Then the PhD candidate searched for and identified themes, reviewed themes, defined, and finally named themes. To establish validity for all analyses, the PhD candidate's supervisory team independently reviewed all analyses and agreement was reached; overall, in keeping with the reflexive thematic analysis approach, and acknowledging that there is no single precise answer (Braun & Clarke, 2013), the aim was to achieve richer interpretations of meaning, rather than consensus of meaning. The specifics for each of the studies is presented below. Furthermore, further references are made to the reflexivity strategies employed below when establishing the validity of the studies that comprise this thesis.

For the first scoping review study (**Study I, Paper I**), data for the fifteen included studies were analysed using qualitative thematic analysis (Braun & Clarke, 2006), described previously. Consistent with the aims of the study, the analysis focussed on (a) synthesising evidence regarding the physical and non-physical aspects of public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion, (b) identifying design recommendations and (c) exploring the current discourses and concepts around designing for outdoor play, social participation, and inclusion in public playgrounds in the context of UD. In the published article, the main results were presented under main themes, that were organised around central organising concepts that the researchers interpreted from the data (Braun & Clarke, 2019). The three resulting main themes were: physical design features of public playgrounds that

facilitate/hinder outdoor play, social participation, and inclusion (Theme 1), non-physical aspects of public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion (Theme 2), and designing for outdoor play, social participation, and inclusion in public playgrounds: concepts utilized, and recommendations identified (Theme 3). A summary table of the main results is provided in the corresponding chapter to illustrate and support the analysis (see Chapter Three).

For the second scoping review study (**Study II, Paper II**), data for the fifteen included studies were analysed using qualitative thematic analysis (Braun & Clarke, 2006), described above. In line with the aims of the study, the analysis focussed on carefully examining how UD, and related non-discriminatory planning and design concepts, are used in peer reviewed articles concerning designing for outdoor play, social participation, and inclusion in public playgrounds. In the published article, and like Study I, Paper I, the results were presented under main themes, that were organised around central organising concepts that the researchers interpreted from the data (Braun & Clarke, 2019). The three ensuing main themes included: definitions, goals, and principles of UD as it relates to public playgrounds (Theme 1), related design concepts used to describe the concept of designing for outdoor play and social participation in public playgrounds (Theme 2), and inclusion and public playgrounds (Theme 3). A summary table of the terms and definitions used in the included studies is provided in the respective chapter to illustrate and support the analysis (see Chapter Four).

In the third scoping review study (**Study III, Paper III**), data for the twenty-seven included guideline documents were analysed using a UD and play value framework (informed by qualitative thematic analysis (Braun & Clarke, 2006)). Corresponding to the study aim, the analysis focussed on identifying the design approaches, design principles and design recommendations utilised within guideline documents for the design of public playgrounds for inclusion. In the published article, and similar to the aforementioned scoping review studies (Study I, Paper I and Study II, Paper II), the results were presented under main themes, that were organised around central organising concepts that the researchers interpreted from the data (Braun & Clarke,

2019). The consequent three main themes included: the main results were reported under three main themes: design approaches (Theme 1), design principles (Theme 2), and design recommendations (Theme 3). A summary table of the design approaches, principles, and recommendations used within the guideline documents is provided in the corresponding chapter to illustrate and support the analysis (see Chapter Five).

Qualitative content analysis

For the first empirical study with "professional experts" (**Study IV, Paper IV**) and second empirical study with "user experts" (**Study V, Paper V**), qualitative content analysis was purposefully selected to analyse data. Qualitative content analysis is a research method for describing and interpreting textual data through the systematic process of coding (Assarroudi et al., 2018). Arising from this process is the identification of categories, themes, and patterns (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). Therefore, qualitative content analysis was employed in Studies IV and V to condense extensive and diverse raw data, to explore and interpret the data, and to determine links between the research objectives and the data interpretation (Elo et al., 2014; Elo & Kyngäs, 2008).

For both empirical studies, the PhD candidate completed all analyses. The PhD candidate began the preparation phase by familiarising herself with the data through repeated rereading. Next, line-by-line open coding was undertaken on all qualitative responses, and data-driven labels were applied to groups of words or sentences to summarise their meaning. Following the coding of all data, the PhD candidate grouped codes with similar meanings into categories, and the process of abstraction occurred until all identified categories were deemed appropriate to adequately describe the data. To establish validity for the analyses, the PhD candidate's supervisory team independently reviewed the analyses and agreement was reached. The specifics for each of the studies is presented below.

For the first empirical study with "professional experts" (**Study IV, Paper IV**), data for the eleven qualitative items were analysed in NVivo (QSR International Pty Ltd)[54] using qualitative content analysis (Elo et al., 2014; Elo & Kyngäs, 2008), described

[54] https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

previously. Corresponding with the aims of the study, the analysis focussed exclusively on comments related to the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland. In the corresponding chapter, the main results are presented under the heading of each research question and selected quotations, reproduced verbatim, were used to illustrate, and support the analysis (see Chapter Six).

For the second empirical study with "user experts" (**Study V, Paper V**), data from all three stages was combined to offer a more complete picture of children and adults' experiences of using playgrounds, and to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts. Data were analysed using qualitative content analysis (Elo et al., 2014; Elo & Kyngäs, 2008), described above. Consistent with the aims of the study, the analysis focussed on children and adults' experiences of using playgrounds, and their ideas to improve the inclusivity of playgrounds. In the respective chapter, selected quotations reproduced verbatim, as well as drawings/artwork produced by the participants, are used to illustrate, and support the analysis (see Chapter Seven).

Ethical considerations

Goodwin and colleagues (2003) asserted that "ethics is an ever-present concern for all researchers; it pervades every aspect of the research process from conception and design through to research practice and continues to require consideration during dissemination of the results" (p. 567). As such, ethical considerations saturated all stages of the research process. For the three scoping review studies (**Studies I – III**) and two empirical studies (**Studies IV and V**), ethical considerations pertained to ethical approvals and the publication of these studies. Moreover, as the two empirical studies included human participants, that is "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**), ethical considerations included informed consent and assent, privacy and confidentiality, possible harm and distress, as well as data management. Furthermore, payments were a further ethical consideration for **Study V**. Each of these considerations are discussed below.

Ethical approvals

Prior to conducting this doctoral research, the PhD candidate and her supervisory team applied to an institutional review board, in this case the Social Research Ethics Committee (SREC) in University College Cork (UCC)[55], for ethical approval. Ethical approval to undertake all five studies was granted in December 2019 (Log 2019-195). Subsequently, an amended ethics application was submitted to the SREC in September 2021 for the second empirical study with "user experts" (**Study V, Paper V**). It was originally anticipated that in-person data collection would take place with family units (referred to hereafter as families); however, the COVID-19 pandemic posed an unprecedented challenge for in-person data collection and fieldwork, and thus, an online format was deemed more appropriate, hence the requirement for an amended ethics application. Ethical approval to conduct online data collection with "user experts" was approved by the SREC in October 2021 (Log 2019-195A1). Furthermore, all five research studies followed ethical principles in accordance with UCC's Code of Research Conduct (UCC, 2016a, 2021).

Informed Consent and Assent

Informed consent was applicable for adult participants in the two empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**). Additionally, informed parental consent and child assent was relevant for child participants in the second empirical study with "user experts" (**Study V, Paper V**). Informed consent involves two related activities: first participants need to comprehend, and second voluntarily agree to the nature of the research and their role within it (Israel, 2015). Assent is defined as a child's affirmative agreement to research participation (Roth-Cline & Nelson, 2013). Although assent is not legally required, it reflects the centrality of the child's voice in research and is considered best practice in researching with children in Ireland (Department of Children and Youth Affairs [DCYA], 2012).

For the first empirical study with "professional experts" (**Study IV, Paper IV**), the PhD candidate made initial contact with potential participants either directly or via a gatekeeper (Table 3). Information was sent via email invitation requesting potential

[55] https://www.ucc.ie/en/research/support/ethics/socialresearch/

participants to complete the electronic questionnaire, and potential participants were supplied with information about the purpose of the research and who is conducting it, to ensure that informed consent was obtained (see Appendix G). Specifically, potential participants were informed that they were under no obligation to take part in the research and that they had the right to refuse to participate and/or to withdraw from involvement in the research at any time during the data collection, up to the point of returning the completed electronic questionnaire, without consequences. Withdrawal after this time was not possible due to the anonymous nature of the online survey.

Similarly, for the second empirical study with "user experts" (**Study V, Paper V**), the PhD candidate made initial contact with potential participants either directly or via a gatekeeper (Table 4). Information was sent via email and potential participants were supplied with information about the purpose of the research and who is conducting it, to ensure that informed consent and assent was obtained. Each adult participant was supplied with an information letter and consent form for their participation and the participation of their child(ren) (see Appendix H). Concurrently, each child participant was supplied with a separate information letter and assent form (parent(s)/ legal guardian(s) were asked to read these with their children where necessary) (see Appendix I). Specifically, potential participants were informed that they were under no obligation to take part in the research and that they had the right to refuse to participate; refuse to answer specific questions and/or to withdraw from involvement in the research at any time during the data collection or up to 4-weeks post data collection, without consequences. Withdrawal after this time was not possible as the data was anonymised for secure archiving. Those who agreed to participate returned informed consent (adult participants for their own participation and the participation of their children) and assent (child participants) forms to the PhD candidate via email prior to data collection. Also, at the beginning of each data collection phase, verbal ongoing consent, and assent was sought from adult and child participants, by the PhD candidate. Participants were reminded that they had the right to refuse to participate; refuse to answer specific questions and/or to withdraw from involvement in the research at any time. All child and adult participants provided ongoing consent and assent.

Privacy and confidentiality

Privacy and confidentiality were pertinent to minimise the identification of participants and protect information/ data shared by "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**) in the two empirical studies. Privacy is defined as having control over oneself, that is, people can choose when and with whom to share information about themselves (Anderson & Corneli, 2017). On the other hand, confidentiality refers to the specific measures that researchers employ to keep information about participants unknown to others, to the extent possible (Anderson & Corneli, 2017). To put it simply, privacy pertains to protecting individuals while confidentiality refers to protecting information/ data that participants share with researchers (Anderson & Corneli, 2017).

For the first empirical study with "professional experts" (**Study IV, Paper IV**) specific efforts were employed to protect participants privacy and confidentiality. Specifically, the online survey did not contain any required fields that would personally identify participants; neither their name, IP address, nor place of work were recorded. Of note, anonymity could not be guaranteed as the sample was drawn from a niche element of the design industry in Ireland; potential participants were made aware of this in the information letter and consent form so that they could make an informed choice as to whether they chose to participate.

Similarly, for the second empirical study with "user experts" (**Study V, Paper V**) specific efforts were adopted to minimise the identification of participants. Specifically, electronic copies of signed consent forms and other documents that include participant names, such as master participant lists and contact information sheets, were stored on secure servers and password protected computers. Moreover, during data collection, all online semi-structured interviews were conducted in a private location where the conversation could not be seen or heard by others. Additionally, pseudonyms (for individual participants) and participant identification numbers (for families) instead of participant names were used on all hard copy and electronic research data including surveys, fieldnotes, photographs, and audio and video recordings and transcripts. Furthermore, when reporting research findings, data were presented in a way that prevents individual participants from being identified;

pseudonyms (for individual participants) and participant identification numbers (for families) were used to conceal participants' identities.

Minimise the risk of harm to participants

Grounded in the ethical principle of "non-maleficence", minimising the risk of harm requires research to employ measures so as not to do those things that may be harmful to others and therefore disallows researchers from causing or allowing harm to research participants (Sim, 2010). As such, minimising the risk of harm to participants was relevant for the two empirical studies that included human participants.

Specifically for online surveys that were completed for the empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**), identifying and avoidance of harm was challenging as it was not possible to know if participants became upset. However, the PhD candidate provided her email contact details in all instances so that participants could make contact for a de-briefing exercise (e.g., discussion) and referral to external services (e.g., counselling) if they wanted such services. Of note, no participants contacted the PhD candidate for a de-briefing exercise.

Moreover, for the empirical study with "user experts" (**Study V, Paper V**), different methods of data collection were considered, as different methods carry different kinds of risks (Anderson & Corneli, 2017). For example, walk-and-talk interviews were considered, as well as naturalistic observations in public playgrounds. However, these methods were not chosen due to the potential psychological harm for those that cannot access and use public playgrounds. Also, it was initially anticipated that data collection with "user experts" would take place in-person, however, as noted, the COVID-19 pandemic posed an unprecedented challenge for in-person data collection and fieldwork, and thus, an online format was deemed more appropriate so as not to cause potential physical harm.

Additionally, for the semi-structured interviews with "user experts" (**Study V, Paper V**), the number of sensitive questions included in the semi-structured interview guide were limited to the most essential, and prior to data collection, participants were

informed that they can choose not to answer any question that makes them feel uncomfortable. Furthermore, for the semi-structured interviews, it was planned that if participants were to become upset during the semi-structured interviews, the interview would be stopped, and time allowed for the participant to regain composure. Following this, the interview would resume if the participant was happy to continue, and the interview would be stopped if they did not want to continue. Moreover, the PhD candidate provided her email contact details in all instances so that participants could make contact for a de-briefing exercise (e.g., discussion) and referral to external services (e.g., counselling) if they wanted such services. Of note, this did not emerge as an issue for the semi-structured interviews conducted with "user experts".

Payments

Largent and Lynch (2020) identified that paying research participants serve several functions, two of which are: (a) reimbursing for out-of-pocket expenses incurred because of research participation, and (b) compensating participants for the fair value of their time and effort expended in research participation. They further asserted that both reimbursement and compensation should be viewed as ethical default because it helps to minimise the chance participants will be exploited and acknowledges the value they contribute to research (Largent & Lynch, 2020).

Therefore, for the second empirical study with "user experts" (**Study V, Paper V**), certificates of participation were distributed by the PhD candidate to all child participants. Also, families were offered a €20.00 gift voucher to compensate for costs incurred because of their participation in this research study. Families were not made aware of the certificates and gift vouchers until after they participated so as not to encourage participation.

Data management

Data management describes the processes whereby research data is stored, protected, processed, validated, disposed of, and archived (Wilson & Darling, 2020). Data management was particularly relevant for the two empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**). Per the

requirements of the enacted General Data Protection Regulation[56], and in in accordance with UCC's Research Data Management Policy (UCC, 2016b) and UCC's Code of Research Conduct (UCC, 2016a, 2021), data were stored securely, coded, and assigned pseudonyms/study numbers so that the research participants could not be identified by anybody other than the PhD candidate and her supervisory team.

Specifically, for the first empirical study with "professional experts" (**Study IV, Paper IV**), to help protect privacy and confidentiality, the online survey did not contain any required fields that would personally identify participants; neither their name, IP address, nor place of work were recorded. Moreover, for the second empirical study with "user experts" (**Study V, Paper V**), all personal information collected by the PhD candidate was safeguarded by the storage of all hard copy research data in a locked cabinet in the PhD candidate's office, and electronic research data was stored on access-controlled encrypted servers, encrypted laptops, and on encrypted hard drives.

Additionally, signed consent and assent forms and other documents that included participant names, such as master participant lists and contact information sheets, were stored on secure servers and password protected computers. Also, pseudonyms (for individual participants) and participant identification numbers (for families) instead of participant names were used on all hard copy and electronic research data including surveys, fieldnotes, photographs, and audio and video recordings and transcripts. Furthermore, all electronic data was stored on the UCC's supplied Microsoft OneDrive[57] in an anonymised form for the duration of the project. In case of data loss or breaches to the data integrity due to operational errors, hacking/viruses, or disasters, the PhD candidate performed routine backups of all data at fixed intervals (for example: daily, weekly).

Following project completion, data will be transferred into electronic format for secure storage in the Department of Occupational Science and Occupational Therapy, University College Cork's NAS local storage. Data will be retained only for the period

[56] https://www.ucc.ie/en/gdpr/
[57] https://www.ucc.ie/en/sit/online-services/microsoftonedrive/

required by regulations and only data required for the project will be retained. In line with the University College Cork's Code of Research Conduct (UCC, 2016a, 2021) data will be securely held for a minimum period of ten years post project and will subsequently be destroyed in a secure way in accordance with the University College Cork's Code of Research Conduct (UCC, 2016a, 2021).

Publishing studies

Four of the five studies in this thesis were submitted to high quality peer reviewed journals for publication. Insofar as possible, studies were published in high quality Open Access journals so that the studies were available free of charge to potential readers. Moreover, as outlined above, efforts were made so that participants were not identifiable in the empirical study with "professional experts" (**Study IV, Paper IV**). Additionally, the PhD candidate and her co-authors (i.e., her supervisory team) were required by the respective journals to sign letters of compliance with ethical practices, disclose the source of funding (i.e., the Irish Research Council for this doctoral research), and to disclose conflicts of interest in the publications of the studies. Furthermore, the order of authorship was decided upon based on effort; the PhD candidate was the primary author in all instances and her supervisory team took different levels of responsibility in reviewing draft versions of the papers as well as changes in response to peer review feedback during the publication process. Finally, as these studies were published in high quality peer reviewed journals, plagiarism was avoided, and the works of others was cited appropriately.

It is worth noting here also that four of the five studies were published in multidisciplinary journals. While this doctoral research was conducted under the profession of occupational therapy, it was necessary to publish the findings from the studies in non-traditional places (i.e., non-occupational therapy journals) as playground design for inclusion attracts a multidisciplinary audience in terms of research and practice. Therefore, a decision was made early on to publish the findings of the studies in multidisciplinary journals to firstly facilitate effective exchange and dialogue between different scientific interests as well as add to the current knowledge base, and secondly, to reach a larger multidisciplinary audience (within and outside the professional realm) for whom this research has implications. For the final study

(**Study V, Paper V**), the manuscript is currently in preparation for publication; the intention is to publish this study in a multidisciplinary journal also.

Establishing validity

As this mixed methods research study included both qualitative and quantitative data, there is a need to address the validity checks associated with both strands. Even though various terms are evident in mixed methods literature, Creswell and Plano Clark (2018) asserted that "the best term to use is validity because of its acceptance by both quantitative and qualitative researchers today and because such use presents a common language understandable to many researchers" (p. 251).

Numerous perspectives exist regarding the importance of validation in research; certainly, numerous scholars have proposed multiple definitions of it, used various terms to describe it, and identified several procedures for establishing it (Angen, 2000; Creswell & Poth, 2018; Eisner, 2017; Lather, 1991, 1993; LeCompte & Goetz, 1982; Lincoln & Guba, 1985; Lincoln et al., 2011; Richardson & St Pierre, 2005; Whittemore et al., 2001; Wolcott, 1990, 1994). Adopted from the work of Creswell and Miller (2000) and Creswell and Poth (2018), four strategies for establishing validity are described below, namely, triangulation, reflexivity, thick description, and peer review/ peer debriefing. These strategies were implemented across the five studies (i.e., **Studies I – V**) that comprise this doctoral research; they applied specifically to design consideration, data generation, data analysis, and presentation of results.

Triangulation

Triangulation concerns a general approach to check and establish the credibility of qualitative findings by analysing a research question from more than one perspective (Patton, 2014). For **Studies I – V**, data output emerged from the PhD candidate's analytical work (Amin et al., 2020), therefore, to improve the credibility of these studies, investigator triangulation was adopted. Specifically, the PhD candidate's supervisory team independently reviewed each of the analyses to check the process of data collection and interpretation to ensure that the analyses were rich, comprehensive, and inclusive of insights and interpretations by different researchers (Amin et al.,

2020). In this way, investigator triangulation allowed for the provision of a richer and more elaborate understanding of the phenomena under investigation (Amin et al., 2020). Additionally, to improve the credibility of the second empirical study (**Study V, Paper V**), methodological triangulation was employed whereby a combination of methods were used. Specifically, between-method triangulation, combining contrasting methods (i.e., online survey, creative exercise, and semi-structured interviews) were used to compensate for the limitations of one approach with the strengths of another (Amin et al., 2020; Bryman, 2016).

Reflexivity

Reflexivity was applicable for all five studies (**Studies I – V**) that comprise this doctoral research. Reflexivity requires the researcher to look inwards to deal with the fundamental influence that the researcher brings to the research (Amin et al., 2020; Treharne & Riggs, 2014). Mauthner and Doucet (2003) acknowledged that a qualitative researcher must acknowledge the pre-conceived assumptions they bring to the research and be self-aware and reflexive about their role in the process of collecting, analysing, and interpreting the data. Willig (2013) confirmed that being a reflexive researcher involves the researcher looking at how their research is informed by their personal circumstances, privileges, facets of identity, experiences, and location. As such, reflexivity concerns the positioning of the researcher (Daly, 2007) alongside a systematic approach for the researcher to pay attention to their role in the production of knowledge during each step of the research process (Malterud, 2001).

For the outset of this doctoral research, the PhD candidate disclosed personal circumstances, privileges, facets of identity, experiences, and location to acknowledge the pre-conceived assumptions she brought to the research. Moreover, to pay attention to her role in the production of knowledge during each step of the research process (Malterud, 2001), the PhD candidate maintained a reflexive journal throughout the research process to reflect on thoughts, feelings, ideas, and hypotheses generated to ensure that data was viewed objectively. Additionally, for the two empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**), the PhD candidate maintained a fieldnote journal to document contextual information during data collection. Finally, the PhD candidate engaged in regular

supervision meetings with her supervisory team which offered further opportunities to become more self-aware and reflexive.

Thick description

Denzin (2001) described thick description as going beyond facts and surface appearances to illuminate social interactions and their meanings. Researchers have clarified that the provision of a rich, thick description, allows readers to make decisions about the transferability of any given study because the writer describes in detail the participants or setting under study (Erlandson et al., 1993; Lincoln & Guba, 1985; Merriam & Tisdell, 2015).

For the first (**Study I, Paper I**), second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies, the provision of thick descriptions to summarise evidence characteristics for the included studies and guideline documents (e.g., geographical location; contribution made by disciplines) was one way to address the transferability of these studies. Additionally, in the two empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**), demographic information on the participants was one way to attend to the transferability of these studies.

Peer debriefing or peer review

Creswell and Miller (2000) identified that having a peer review or debriefing of the data and research process means that the researcher seeks an external check "by someone who is familiar with the research, or the phenomenon explored" (p. 129). Lincoln and Guba (1985) defined the role of the peer debriefer as a "devil's advocate", in other words, someone who keeps the researcher honest by asking hard questions about methods, meanings, and interpretations.

Peer debriefing was relevant for all five studies. Specifically, data output for all five studies (**Studies I – V**) emerged from the PhD candidate's analytical work; thus, as noted previously, the PhD candidate's supervisory team independently reviewed each of the analyses to check the process of data collection and interpretation to ensure that the analyses were rich, comprehensive, and inclusive of insights and interpretations

by different researchers (Amin et al., 2020). These independent reviews allowed for peer debriefing to discuss the analyses until consensus was reached. Moreover, I engaged in regular supervision meetings with my supervisory team which offered further opportunities for peer debriefing.

Additionally, four of the five studies were published in high quality peer reviewed journals, the PhD candidate and her co-authors had to answer questions from the peer reviewers for each of the respective studies, during the peer review processes prior to publication. During these peer review processes, credibility was enhanced as the PhD candidate and her co-authors had opportunities to reflect on biases that potentially affected different aspects of the research processes including the formulation of the research questions, the methodological designs, as well as interpretations (Amin et al., 2020).

Time and effort for publishing studies

As this thesis is a thesis by publication, it is worth noting that publishing four (**Studies I – IV**) out of the five studies that comprised this doctoral research necessitated significant effort and time. In addition to conducting the studies, effort pertained to manuscript preparation as well as rounds of revision(s) in response to peer review feedback from the respective journals. Time pertained to the timeframes involved from manuscript submission through to publication, which ranged from six months to almost eleven months (Table 8); however, these timeframes must be prefaced in the context of COVID-19 which impacted timeframes for manuscript reviews.

Table 8: Timeframes from submission to publication for Studies I – IV

	Date of submission	**Date of first decision**	**Rounds of revision**	**Date of final resubmission**	**Date of online publication**
Study I, Paper I: Disability and Rehabilitation	09 June 2020	31 Aug. 2020	Three	27 Nov. 2020	10 Dec. 2020

Study II, Paper II: Disability and Rehabilitation: Assistive Technology	03 Aug. 2021	25 Sept. 2021	Two	17 Dec. 2021	09 Feb. 2022
Study III, Paper III: Children's Geographies	28 June 2021	04 Feb. 2022	One	28 Feb. 2022	10 May 2022
Study IV, Paper IV: Landscape Research	09 Sept. 2021	08 Nov. 2021	Two	28 Feb. 2022	06 Apr. 2022

Abbreviations: Feb. = February; Apr. = April; Aug. = August; Sept. = September; Nov. = November; Dec. = December

Conclusion

To summarise, the ambition of this thesis was to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level. Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD and includes five studies that employed multiple methods (three scoping review studies and two empirical studies) to review published and grey literature as well as explore the perspectives of "professional experts" and "user experts". Consequently, different participants, data collection, and data analysis methods were purposefully selected. Finally, ethical considerations saturated all stages of the five studies that comprise this doctoral research. Each of the five studies will be discussed in the following chapters.

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Chapter Three: Study I, Paper I

Moore, A., Lynch, H., & Boyle, B. (2022). Can universal design support outdoor play, social participation, and inclusion in public playgrounds? A scoping review. *Disability and Rehabilitation, 44*(13), 3304-3325. https://doi.org/10.1080/09638288.2020.1858353

Responding to the overall aim of this thesis, this scoping review study (**Study I, Paper I**) aimed to review evidence for using UD in public playground design. Specifically, the aim was to identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD (**Study Aim 1**). Therefore, to situate this thesis within international literature, all available peer reviewed literature on inclusive public playgrounds was identified and synthesised in relation to physical design features and non-physical design aspects that facilitate or hinder outdoor play, social participation, and inclusion. Moreover, design recommendations and specific design approaches were reviewed in the context of determining the use of UD for public playground design.

With supervision and guidance from her supervisory team (Dr Helen Lynch and Dr Bryan Boyle), the research design, data collection, data extraction, and data analysis were conducted by the PhD candidate. The PhD candidate wrote this paper with supervisory support and mentorship from her supervisory team. This study was published in the Disability and Rehabilitation Journal following three rounds of revisions in response to peer review feedback. Revisions primarily pertained to clarifying the aim of the paper in relation to the documents reviewed (restructuring the findings) and discussion of the findings. This study was originally published by the Disability and Rehabilitation Journal as an advance online publication on 10 December 2020 and was subsequently assigned to a volume and issue on 03 July 2022.

The study is presented here as it appears in print; consequently, there is some overlap with the previous sections of this thesis. The figures and tables are presented at the end of the chapter.

Title

Can universal design support outdoor play, social participation, and inclusion in public playgrounds? A scoping review

Abstract

Purpose: To synthesize evidence regarding the physical design features and non-physical aspects of public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion; identify design recommendations; and explore the current discourses and concepts around designing for outdoor play, social participation, and inclusion in public playgrounds in the context of Universal Design (UD).

Methods: Published studies addressing public playgrounds, inclusion, and design, were identified via a systematic search of eleven databases from health, science, education, and humanities.

Results: Fifteen documents met the inclusion criteria. Three main themes were identified concerning physical design features and non-physical aspects of public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion, with associated design recommendations. Although UD is recognized to have the potential to support the design of public playgrounds, no studies examined UD solutions for playgrounds or tested them for effectiveness.

Conclusion: We cannot yet determine whether UD can support outdoor play, social participation, and inclusion in public playgrounds. Research to date has mostly focused on understanding users' perspectives; future research should continue to be informed by diverse users' perspectives to address gaps in knowledge concerning children's voice from migrants, lower socioeconomic communities, and intergenerational users with disabilities alongside researching design solutions for play.

Implications for rehabilitation

- Children, particularly children with disabilities and their families, continue to experience marginalization and exclusion in public playgrounds, despite a commitment to inclusion in international treaties.
- Universal design is recognized to have the potential to support the design of public playgrounds, however, the evidence is currently very sparse.

- While accessibility is an important consideration for playground design, it does not ensure that play occupations can take place.
- Extending knowledge on universal design as it applies explicitly to playgrounds and play occupation requires multi- and trans-disciplinary collaboration that includes a play-centered perspective.

Keywords
play; outdoor play; playground; playground design; inclusive design; universal design

Main text

Introduction

Play is recognized as essential to the social, emotional, cognitive, and physical wellbeing of children [1–3]. Different academic disciplines provide multiple understandings of what play is, what it can do for both individual children and society, and conversely, what play deprivation can mean for children, families, and society [4]. For this paper, play occupation is used to differentiate it from play skills or play activities, which are frequently the focus of other disciplinary perspectives on play [5–8]. Play occupation refers to play that is characteristically active, freely chosen, process rather than outcome-oriented and intrinsically motivating [9]; otherwise referred to as play for the sake of play [8].

Within play research, outdoor play has become increasingly important as a source of wellbeing [5,10]. Outdoor play has been associated with increased physical activity, indicating that outdoor play is characteristically less sedentary and more physical than play indoors [11–13]. Outdoor play has been further associated with opportunities for children to develop independence, self-determination, and physical skills [14]. Moreover, researchers have identified a myriad of social, emotional, cognitive, and physical benefits for children engaging in outdoor play that is less supervised, less structured, more adventurous and includes elements of challenge and risk [15–20]. However, participation in outdoor play is under threat in many industrialized countries in particular because of restricted access to gardens and green areas, concerns about road safety and stranger danger, restricted independent mobility, heightened emphasis on academic learning and increased scheduling of adult organized activities and

sedentary screen-based behavior [1,11,21–29]. Reductions in play opportunities have been documented internationally with researchers coining terms such as “play deprivation” [23], “nature deficit disorder” [25], and “poverty of experience” [24].

To address these mounting concerns, particularly regarding the need to balance children’s safety with wellbeing [30,31], attention has been directed toward the design of built environments in terms of how they contribute to people’s health, social participation, and attainment of human rights [32]. Although children’s play takes place in many environments outside such as homes, local neighborhoods, schools, public spaces, and locations found by children to suit their play needs [33], public playgrounds, the focus of this paper, are considered to have a crucial role in portraying a public message that children are welcome to play in a particular locality [33]. Public playgrounds are typically located in a neighborhood or at a location where playground users are expected to drive or take public transportation to utilize the play space [34]; they are generally adult-planned and managed outdoor play spaces, broadly accessible to the public, and typically include equipment that is purpose-designed and built for children [35]. However, public playgrounds are typically designed to facilitate communities and provide meaningful opportunities for social interaction between children and parents of different social and ethnic characteristics and are potentially significant in enabling inclusion [36–39]. Moreover, public playgrounds are regarded as essential settings for children to play, experience and interact with their social and physical environment, test their abilities, and develop physical, social, and motor skills [11,40–45]. Therefore, participating fully in public playgrounds has potential for wide-reaching effects that extend beyond these spaces and beyond childhood [46].

However, researchers have been proposing for some time that the physical and non-physical environments of playgrounds can inadvertently perpetuate marginalization and exclusion because of the way in which policy is developed and operationalized, or indeed absent in relation to play provision [44,47], which can result in barriers such as, inadequate access, inadequate play options and play value, and limited opportunities for social interaction [35,38,43,44,46,48–55]. And while decreased opportunities apply to many groups of children [10], it is potentially amplified for children with disabilities because of additional factors including attitudinal, physical,

and social barriers resulting in reduced opportunities to benefit from participating in play compared with other children [56,57]. Thus, many children are not afforded opportunities to benefit from participating in outdoor play due to tensions between children and adult-planned and managed play environments [58]. Nonetheless, having opportunities to play and access the physical environments for play is a human right of all children [59]. As such, the notion of providing inclusive public playgrounds is gaining momentum to address the barriers that both children and their families experience [58] and reframe playground design as "the architecture of social participation" [32,44].

For some time, researchers have proposed varied concepts and methods to address non-discriminatory planning and design for playgrounds, including for example accessibility, usability, inclusive design, barrier-free design, and design for all [4,35,43,44,50,54,55,60–64]. However, lately, it is proposed that UD which is underpinned by seven principles [65] and eight goals [32], is the way forward for providing conceptual guidance for solving the problem of designing playgrounds that are inclusive for all [4,11,33,35,43,44,53,60]. As initially perceived, UD was focused on "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" [66,p.1]. In recent years, UD has "acquired global significance and become orthodoxy of what is presented as the very best of design practice" [67,p.873]. This is emphasized in General Comment No. 17 (GC17) on the right to play [10] and by the inclusion of UD in the Convention on the Rights of Persons with Disabilities (UNCRPD) [68] as a means to overcome inequities of access to the built environment [69]. Significantly, the UNCRPD articulated that "disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others" [68,Article1], shifting traditional views of disability from the level of individual responsibility to the interactional [70]. UD was, therefore articulated as an approach which has the potential to enable people by dismantling disabling barriers and creating the right environmental conditions for social inclusion across all human abilities [70]. UD is increasingly being applied to policy relating to the design of built environments internationally, to reduce discrimination and enhance social participation [71], and

applied to playground design, with the need to ensure targeted consideration for those groups who are at particular risk of play deprivation. According to GC17 [10], these groups include children with disabilities, girls, children living in poverty, children in institutions, children from indigenous and minority communities as well as children in situations of conflict, humanitarian and natural disasters [10].

Although UD in the built environment is commonly referenced, there is a general lack of knowledge about UD as a design approach to date [72], and research regarding its efficacy remains emergent [69]. O Shea et al. [73] observed that "UD is not easily investigated by traditional scientific methods of analysis and validation, there are no clear criteria for what constitutes a universally designed built environment, and there is little consensus on how UD principles should be applied or evaluated" [69,p.2]. Furthermore, Lid identified that understanding UD concerns requires an understanding of barriers from individual perspectives [74]. Individual perspectives are developed as user-based knowledge from a first-person perspective, embodied knowledge [74]. Thus, understanding the barriers for diverse groups is fundamental before determining what design approaches best support outdoor play, social participation, and inclusion in public playgrounds.

While there has been some effort to examine the evidence for best practice for inclusive playground design [75] and to determine evidence for accessibility and usability of playground environments for children [43], to date, there has not been a systematic analysis of peer reviewed studies to synthesize evidence on public playground design that facilitate/hinder outdoor play, social participation, and inclusion. Moreover, the current discourse around designing for social participation and inclusion in public playgrounds has not been explored in relation to the applicability of UD. Consequently, it is challenging to build a comprehensive model for applying UD to playgrounds due to the current lack of evidence to inform best practice in inclusive playground design and provision [11]. Thus, the purpose of the present study was to conduct a scoping review of peer reviewed published literature informed by a UD perspective to (a) synthesize evidence regarding the physical and non-physical aspects of public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion, (b) identify design recommendations and (c) explore the

current discourses and concepts around designing for outdoor play, social participation, and inclusion in public playgrounds in the context of UD.

Methods

This scoping review followed Arksey and O' Malley's [76] methodological framework for good practice in conducting scoping studies, and further methodological intricacies as recommended by the Joanna Briggs Institute [77] and other researchers [78]. Scoping reviews seek to map the extent, range and nature of a body of literature that has not been reviewed extensively or exhibits a large, complex, or heterogeneous nature not amenable to a more detailed systematic review [76,77,79]. The scoping review framework combined five stages, which will be described concerning this study. Of note, a UD lens was adopted to map the extent, range, and nature of published peer reviewed literature relevant to public playground design.

Stage 1: Identifying the research question(s)

The questions this scoping aimed to address were: (1) What are the physical design considerations for public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion? (2) What are the non-physical design considerations for public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion? and (3) What is known about designing inclusive playgrounds, and what recommendations/design approaches underpin the current discourses around designing for outdoor play, social participation, and inclusion in public playgrounds from a UD perspective? The findings presented later in the paper correspond to each of the three questions; theme one corresponds with question one, theme two relates to question two, and theme three endeavors to answer question three.

Stage 2: Identifying relevant studies

To obtain the most relevant results, the first author consulted an expert librarian to validate the search strategy and database choices before conducting electronic searches in November 2019 – see Table 1 for the final list of primary and secondary search terms. The primary search terms included a breakdown of how public playgrounds are described in the literature. While this study adopted a UD lens, the secondary search terms included other related concepts (as noted earlier) that are

currently used to describe non-discriminatory planning and design processes internationally, including barrier-free design, building for everyone, accessible design, and architectural access. Terms more closely associated with UD are also included, for example, inclusive design [80] and design for all [32]. Despite some semantic differences and different place of origin, these approaches share a similar aim to UD in terms of considering people's diversity to the greatest extent possible [72].

A systematic search of peer reviewed studies was conducted using eleven databases from health, science, education, and humanities to ensure the inclusion of diverse perspectives: Academic Search Complete, CINAHL, Education, ERIC, MEDLINE, PsycINFO, SocINDEX, SPORTDiscus, Scopus, Web of Science and PubMed. The primary search terms were first searched independently and then combined with the secondary search terms using the Boolean AND operator. Duplicates were removed from the search results, yielding 117 studies. Based on guidance by the Joanna Briggs Institute [77], the first author then manually searched reference lists of relevant studies for any additional resources, yielding a further forty-one studies. Figure 1 illustrates the number of publications in each year of the review period. Figure 2 shows the search yield and screening process.

Stage 3: Study selection

All citations were uploaded to EndNote X9 (2019) reference management software for the screening and selection process. A. M., H. L., and B. B., independently screened titles, and abstracts. The reviewers met on many occasions to discuss uncertainties related to study selection; as such, development of the inclusion/exclusion criteria was iterative as familiarity increased with the literature. Studies were selected using the inclusion and exclusion criteria detailed in Table 2.

No date limits were set to ensure that all research conducted on the topic was captured. Following the initial screening and full-text review, a combined eighty-seven studies were excluded based on the following criteria: not concentrated on public community playground design "for inclusion" (n = 41), not focused on playgrounds intended for community use (n = 19), not peer reviewed (n = 9), not original data collection (n = 8),

field reports (n = 6), full text not available (n = 3) and focused on the technical aspects of design that do not translate to international contexts (n = 1).

A. M. and H. L. independently read the full texts of studies corresponding with the inclusion criteria. The additional validation process was then conducted, where all included studies, and 20% of the excluded studies were randomly selected and reviewed by a third reviewer (B. B.). Consensus was reached through discussions. A total of fifteen peer reviewed studies met the inclusion criteria. The study selection process from study identification to final inclusion is represented in Figure 2.

Stage 4: Charting the data

The first author created and reviewed the data extraction chart multiple times in the data extraction process to ensure that all relevant data to answer the research questions were extracted from the included studies. As suggested by Levac et al. [78], the extraction process was iterative; the authors frequently met to discuss goodness-of-fit of the data extraction chart with the content of studies included and adapted the extracted data form accordingly. As a test of consistency, one other author (H.L.) independently reviewed two of the included documents and extracted data according to the data extraction chart. Following this, the individual extractions were examined and compared. All three authors agreed that the data extracted by each reviewer were consistent with each other and the data extraction chart allowed for all relevant data to answer the research questions to be extracted.

Stage 5: Collating, summarizing, and reporting the results

Using the data extraction chart, data were collated and summarised. Numerical summaries described the data quantitatively, and thematic analysis guided by Braun and Clarke's [82] six-step approach to thematic analysis, provided a complementary qualitative description of the findings. Data analysis was conducted by a single author of this scoping review (A.M.) and independently reviewed by the remaining authors (H.L. and B.B.). All information from the data extraction was summarized in table form (Table 3).

Results

Evidence characteristics

Fifteen studies from eleven first-named authors met the inclusion criteria for this review. Publication dates of the studies spanned from 1999 to 2019, with twelve published in the last 10 years. Most studies in this review originated from Europe (n = 8, 53%) or America (n = 4, 27%), with the remaining evidence arising from Canada, Australia, and New Zealand (Table 4). While built environment disciplines, such as architecture and planning were present within this literature [42,75,83], the most significant contribution was made by health disciplines and humanitarian scholars [38,43,44,50–52,60,61,84,85]. Education scholars also contributed [54,55].

A combination of methodologies, and mixed methods approaches were evident across the fifteen studies (Table 5). However, a common approach across the included studies was to employ qualitative methods to examine users' perspectives and identify current conditions that, by design, include and/or exclude children in public playgrounds, or review the built environments. A total of 1270 participants were involved in these fifteen studies, yet of these only 26 were children who used the playgrounds. As shown in Table 6, the reports of parents and caregivers of children aged from birth to fifteen years with disabilities were sought in seven of the studies [42,51,52,54,55,61,85]. A further four studies included the reports of municipality representatives, members of the Ludi "Play for Children with Disabilities" COST Action network, not-for-profit organization representatives and caregivers with disabilities [44,50,61,85]. Only three studies included the perspectives of child participants with and without disabilities [52,60,61] and one sibling [52]. None of these children represented other groups of children at risk of play deprivation (e.g., migrant children, children from lower socioeconomic communities). A further 433 existing parks and playgrounds were evaluated across four of the studies [38,42,83,84]. Furthermore, two studies included a review of the literature [43,75], while one study included a review of policies and guidelines also [44].

Summary of main findings

Three themes were identified from the data extracted through thematic analysis (Table 3). The first two themes relate to research questions one and two and describe design

considerations for public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion. Design considerations are divided into: (1) physical design features and (2) non-physical aspects. The third theme addresses research question three and outlines the physical and non-physical design recommendations identified in the included studies, that arose as an outcome of the users and providers perspectives, to maximize inclusion in playground design. The design recommendations were informed by varied concepts in designing for inclusion; for this paper, the seven principles of UD were used as an analytical tool to map the recommendations with further emphasis on specific design approaches adopted and the applicability of UD.

Theme 1: *Physical design features of public playgrounds that facilitate/ hinder outdoor play, social participation, and inclusion*

The physical design features of public playgrounds can facilitate/hinder outdoor play, social participation, and inclusion, especially for children with disabilities. Physical design features were primarily reported with reference to facilitators and barriers.

Facilitators

Facilitators to outdoor play, social participation, and inclusion were categorized into two main issues: physical access to the playground environment, and then once there, accessing and using the playground components. Five studies determined physical design features of public playgrounds that facilitate outdoor play, social participation, and inclusion, particularly for children with disabilities [44,75,83–85] (Table 3). These included: the location of the playground (e.g., within walking distance) [83,85], accessibility features that facilitate equitable access (e.g., accessible pathways leading to all elements around and within the playground) [44,75,83,84], the inclusion of support items (e.g., accessible car park spaces) [83,84], and safety features (e.g., fencing) [44,84]. More specifically, seven studies explored physical design features more particular to the designated play space and playground components that provided more diverse play experiences for all children [43,44,60,75,83–85] (Table 3). These included: a circular playground design [75], inclusive play items (e.g., full-body support swings) [83–85], play items with a recognizable design (e.g., house), play

items that provide for stimulation of all of the senses, and the inclusion of loose parts [43,44,60,75,84].

Usability was also closely related to the play value of the physical environment. For example, specific spaces in the playground such as multi-niche settings [75], observation points, comfortable places, space to interact socially and meet up with friends and green spaces were noted to be of benefit for all children [44,75,83]. One study advocated for spaces that accommodate simple repetitive play for children that desire it [44]. Finally, a design that is simple and easy to understand, requires low physical effort, accommodates different play preferences and styles (cognitive, sensory, motor, social), and provide for appropriate challenge and risk [44,75] were regarded as inclusive.

Barriers

In contrast, when design for accessibility, usability, and play value was poor, barriers to play were identified. All fifteen studies reported on physical design features of public playgrounds that presented barriers for outdoor play, social participation, and inclusion, particularly for children with disabilities [38,42–44,50–52,54,55,60,61,75,83–85] (Table 3). Significantly, fourteen studies identified the absence of many accessibility features that resulted in exclusion [38,42–44,50–52,54,60,61,75,83–85]. These included: a lack of nearby accessible car parking [38,43,84], inaccessible entrances (e.g., presence of stairs) [50,51,61,83], inaccessible ground surfaces (e.g., sand) [38,43,51,60,83], surfacing that slows children down [54], inaccessible routes [38,84], narrow path widths [84], irregular path surfaces [50,84], high curbs [84], borders in the form of half-buried logs [50], steep gradients [50], absence of adequate lighting [84], lack of pathways leading to play items [44], enclosures with narrow openings [50], and lack of alternative options to access elevated play items [44,51]. Other elements that impacted accessibility were not defined but identified as getting to the playground being too hard [85]. Additional barriers included a lack of safety (e.g., fencing, shade, color contrast) [38,42–44,51,52,54,55,60,84], and the availability and accessibility of playgrounds being determined by socioeconomic status and place of residence [43,84].

Barriers to usability and the consequential poverty of play experiences was also identified in twelve studies that identified considerable design barriers, particularly for children with disabilities [38,43,44,50,51,54,55,60,61,83–85] (Table 3). These included: a lack of routes to access elevated play items [38,43,50,61,84], play items not designed for children with disabilities (e.g., swings not capable of fully supporting the user) [44,50,84], lack of usable play items (e.g., too small, too high, too complicated) [44,61,83,85], and the absence of specific spaces that support social or physical inclusion (e.g., less stimulating area) [84,85]. Also, the absence of simple play items (e.g., moveable toys) [51,60], play items that provides for stimulation of all of the senses [84], play items with recognizable design, and inadequate activities that hold the children's interests [54,55,60], were noted as barriers. Finally, one study identified the removal of play items from playgrounds without consulting children as a significant barrier [60].

Although accessible/inclusive play equipment did exist in some playgrounds within these studies, eight studies identified a lack of effectiveness of these design solutions [43,44,51,52,54,55,83,85] (Table 3). Specifically, the location of accessible/inclusive play equipment in isolation from other play equipment were regarded as contributing to a segregated/stigmatizing design [44,51,55,83]. Where a ramp existed to access elevated play items, no play opportunities at the top of the ramp, resulted in limited usability and playability [52,54,85]. Also, ground-level, and accessible play equipment were regarded as lacking in play value and deemed unenjoyable [43,54,55,85]. Finally, inclusive playgrounds were criticized for their age-appropriateness and considered ineffective for children less than five years of age [54,55], and playgrounds in general were reported as not being able to meet the needs of younger and older children in one setting [43]. So, although accessibility and usability features had been considered in some playground designs, the actual outcome (i.e., play value) was not included as an essential design consideration.

Because of the physical design features of public playgrounds that presented considerable barriers, children with disabilities primarily, were precluded access to the playground space or parts of the structure. Specifically, nine studies identified that adult assistance was required to play which resulted in limited social opportunities

[43,44,50–52,55,60,61,83] (Table 3). Subsequently, children with disabilities had reduced opportunities to make friends and be independent [51], which was further attributed to the acquirement of secondary disabilities [50,52,61]. Moreover, for children requiring adult assistance, they were found to feel embarrassed [51] and fearful of being teased/bullied by peers [55,60]. As a result, as children with disabilities got older, they avoided visiting and using playgrounds [61]. Thus, social barriers were an outcome of the physical design barriers which shows that the physical environment underpins issues concerning social participation in playgrounds.

Theme 2: *Non-physical aspects of public playgrounds that facilitate/ hinder outdoor play, social participation, and inclusion*

In addition to the physical design features of public playgrounds, the non-physical aspects can also facilitate/hinder outdoor play, social participation, and inclusion, most notably for children with disabilities. Non-physical aspects included attitudes, knowledge, and training, and were primarily reported also as facilitators and barriers.

Facilitators

Family and child attitudes were identified as a facilitating factor for pursuing visiting public playgrounds. Specifically, five studies found that families and children alike valued playgrounds [42,52,55,60,85] (Table 3). One study found that all children described playgrounds as a place everyone knew very well and would miss if it did not exist [60], while a further study identified that families valued playgrounds for specific reasons (child's enjoyment, imagination, being a part of the social/family experience) [52]. The remaining studies found that families pursued visiting playgrounds for their child with disabilities [42,55,85]. Families/parents were noted to play an active role overall; they encouraged their children to play with other children [42], and actively planned for and supported their children's outdoor play participation [85].

Outside of the immediate family, attitudes of extended networks and communities were also identified across two studies as facilitating children's outdoor play participation [75,85] (Table 3). One study identified that community support in terms of inclusion and acceptance was particularly crucial for children with disabilities and

their caregivers in public playgrounds [85]. Moreover, the remaining study, identified several factors that facilitate children's outdoor play participation (e.g., staff experience and training) [75] (Table 3).

Positive attitudes towards designing for inclusion were also evident among playground providers. One study recognized the positive work that playground planners/designers/providers were already doing to support outdoor play, social participation, and inclusion as a point of discussion out of the interview data [85]. Specifically, playground designers/planners/providers were engaged in educational campaigns around disability awareness and stigma reduction, consulted with communities about preferences and needs and worked to integrate social interaction into a playground to support feelings of acceptance [85]. Furthermore, one study noted that playground planners/designers/providers were aware of their limitations in the area of inclusive playground provision and wished for more knowledge of design for consideration of children with restricted mobility [50] from multiple stakeholders including users/experts [42,50–52,54,55,61], advocacy organizations [55], special education professionals [54,55], and rehabilitation professionals (e.g., occupational therapists) [51,52,54,61].

Barriers

Nonetheless, negative attitudes were also a common challenge among these studies. These included issues relating to the attitudes of other caregivers toward disability-related issues [55], social stigma [85], and perceptions of not being accepted, which were identified as barriers for children with disabilities and their caregivers. Furthermore, attitudinal barriers among fundholders and policymakers meant that provision for children with disabilities was either not prioritized or not considered because of perceived additional cost [43,50,55,61,85].

Alongside attitudinal barriers, there was also evidence in seven studies of insufficient knowledge of design for inclusion of children with disabilities among those that plan/design/provide public playgrounds [38,42,43,50,51,61,85] (Table 3). Insufficient knowledge was primarily attributed to external factors such as the lack of policy and legislation (e.g., national policies that address children's play) [43,44,84], resulting in

the provision of public playgrounds that comply with the minimum accessibility standards [54,55,85]. Moreover, two studies reported that poor enforcement of international and national policies acted as a significant barrier [54,55], while one study recognized the limitations of civil rights policies [55]. A further study identified that the interpretation and implementation of safety standards led to limiting play in nature and the provision of sterile and uninteresting environments [85]. Lastly, poorly administered systems of management [43,50,61] in municipalities meant that children's play was an interdepartmental responsibility [44] resulting in disjointed play provision.

Theme 3: *Designing for outdoor play, social participation, and inclusion in public playgrounds: concepts utilized, and recommendations identified*

The third theme addresses the question: what is known about designing inclusive playgrounds. Most studies identified physical and non-physical design recommendations that arose as an outcome of the users and providers perspectives to maximize inclusion in playground design and were informed by varied concepts in designing for inclusion. The seven principles of UD were used as an analytical tool to map the recommendations with further emphasis on specific design approaches adopted and the applicability of UD.

Recommendations for physical design features

Ten studies identified design recommendations concerning the physical accessibility aspects of public playgrounds, appropriate to meet the needs of sections of the population (primarily children with disabilities) [38,42,44,51,52,61,75,83–85] (Table 3). General design features that encourage families to stay and play were evident in recommendations: for example, access to shade, toilet provision with large changing tables, picnic tables, safety features (e.g., fencing), and the installation of appropriate lighting to encourage evening use [38,51,52,83–85] (Table 3).

However, recommendations for the physical design features are closely aligned to some of the seven UD principles to playground design. For equitable use (principle 1) design recommendations included the inclusion of accessible car parking spaces, accessible entry points, regular and accessible pathways leading to all elements around

and within the playground, and accessible surfacing (e.g., rubber tiles) [38,42,44,51,52,61,75,83,84]. For perceptible information (principle 4), design recommendations included the inclusion of signage that addresses different learning styles [83]. For size and space for approach and use (principle 7) design recommendations included the inclusion of enough space for maneuvering between and on pieces of equipment, equal amounts of elevated and ground-level items, ramps or transfer systems to access elevated items, and singular usable methods of accessing play items [44,52,61,75,83].

Flexibility in use (principle 2) was also evident. Specifically, nine studies determined design recommendations concerning the physical design features more particular to the designated play space and playground components, appropriate to meet the needs of sections of the population (primarily children with disabilities) [42,44,51,54,55,61,75,83,84] (Table 3). Design recommendations included the inclusion of: a circular playground design that links complementary activities for children with autism [75], and accessible play items (full-body support swings, side-by-side slides, equipment that enables children to maintain neutral body posture, support features on play equipment such as supporting rails) [42,44,61,83,84]. Also, specific spaces in the playground such as multi-niche settings (equipment/activities that require more than one child to operate or play) [75], observation points or "jump in" points, comfortable places, space to interact socially and meet up with friends, and green spaces were noted to be of benefit for all children [44,75,83]. For all children then, additional play items were also identified as contributing to more diverse play experiences and contributed to simple and intuitive use (principle 3); these included sensory play items (e.g., telescopes, structures with mirrors, musical equipment, talking tubes, sand, sensory garden) [54,55,84], loose parts (e.g., various props, playhouses and tables, sporting equipment) [75], play items with recognizable design (e.g., house, car, boat, animal), and simple equipment (e.g., moveable toys or playhouses) [51,60,75].

In addition to spaces and play items, the need to provide age-appropriate play items was determined across three studies [54,55,84] (Table 3). These recommendations related to flexibility in use (principle 2) as well as low physical effort (principle 6).

Design recommendations included the provision of separate areas for different age groups as well as age-appropriate play items drawing on the recommendations of national bodies [86] in the USA [54,55] (Table 3). Furthermore, the need to provide for risk and challenge was also identified across three studies [44,75,85] (Table 3). Design recommendations included the inclusion of play items that offer appropriate levels of challenge and risk for children of all abilities [44,75], play items that support social interaction and challenge across developmental levels (e.g., construction, water, or sand play) [85], and the provision of risk-rich play spaces that offer opportunities for adventure and excitement with consideration for tolerance and error (principle 5) [44]. A further consideration was made for designing for individual play preferences and styles [44]. Finally, four studies recommended the need to design opportunities to interact socially with peers [42,51,54,60] by incorporating play items with a recognizable design and play items that would support private conversations (e.g., playhouses) [60].

Recommendations for the non-physical aspects

In addition to the design recommendations concerning physical aspects of public playgrounds, five studies identified design recommendations for the non-physical aspects of playgrounds, appropriate to meet the needs of sections of the population (primarily children with disabilities), relating to attitudes, knowledge, and training [38,42,43,55,84].

To redress barriers pertaining to limited knowledge and negative attitudes towards inclusion among those that plan/design/provide playgrounds, four studies identified a need for the establishment of legislation, policies, and standards [38,43,55,84]. Three studies were prescriptive on what these should look like: to determine what an accessible playground is or should be [43], a commitment to providing inclusive playgrounds [38], and ensuring that minimum standards are enforced [84]. The remaining study noted that legislation at national and local levels are fundamental in facilitating social change to improve playgrounds for children aged 2–5 years [55]. Despite much of the recommendations focusing on the establishment of legislation, policies and standards, a further study noted that existing legislation should be carefully implemented [42]. Finally, it was proposed that the sales representative's

profit to be made from the sale of playground equipment should be eliminated or limited [54].

Additional recommendations included: local governments should be supported through scientific/academic studies and financially [42], and the government should support familial and community agency to advocate for their own needs [85]. Specifically, four studies identified key people thought to be important stakeholders in the planning and design of playgrounds that support outdoor play, social participation, and inclusion [43,51,84,85] (Table 3). One study determined that society should be responsible for ensuring change occurs, not just parents of children with disabilities [51], while three further studies referred to the involvement of users/experts in playground design [43,84,85] (Table 3). Moreover, four studies proposed that occupational therapists can play a crucial role in playground design due to their knowledge on play needs, combined with usability and accessibility of play environments [43,51,52,60] (Table 3). Also, one study identified that future research should seek to understand local government organizational structures and determine the decision-makers concerning children's services [85].

Furthermore, training needs were identified for those that plan/design/provide public playgrounds to acquire knowledge on design for consideration of children with disabilities [38,42,54,61] (Table 3). Specific training identified included: UD and playground accessibility [38] as well as child development and special education professional development courses [54]. One study further proposed that training should be provided to caretakers, playground staff, and teachers on how to effectively integrate children with and without disabilities [75].

From an attitudinal perspective, local authorities were identified as needing to play an essential role in increasing awareness about disability-related issues and increasing acceptance among residents and society [83]. Moreover, addressing barriers in the wider community were identified across two studies [42,55] and included awareness rising and changing attitudes of the children without disabilities towards children with disabilities [42], as well as the need for parents to educate their children on accepting children with disabilities [55].

Additionally, to redress barriers concerning attitudes towards children with disabilities and their caregivers, three studies identified the need for interventions in the social environment. One study identified the need for effective interventions to increase the social interactions between children with and without disabilities to be developed and implemented in playgrounds [42]. Two further studies were more specific on what the interventions should/could consist of (e.g., incorporating programs, such as peer buddies/trained playworkers, and the involvement of community organizations such as YMCA), appropriate to meet the needs of sections of the population (i.e., children with disabilities) to develop friendships [54,55]. In addition to identifying interventions for children with disabilities primarily, these were extended to adult caregivers and families more broadly (e.g., provision of a peer support network) [55].

Specific design approaches and the applicability of UD

Ten studies reported specific design approaches thought to support outdoor play, social participation, and inclusion in public playgrounds [43,44,51,52,54,55,60,75,83,85] (Table 3). Of these, the most used concept across the studies was UD. Seven studies advocated for the design of playgrounds that comply with the principles of UD [43,44,51,52,54,55,60]; however, six of these seven studies did not identify how UD could be applied to playground design [43,51,52,54,55,60]. Instead, four studies focused on aims/goals of UD; the overriding consensus was to facilitate social participation and inclusion [43,51,52,60]. In comparison, the remaining two studies conceptualized UD as going beyond what is minimally required by law [54,55]. Nonetheless, one study discussed the potential application of the seven principles of UD to playgrounds alongside play value principles; the study concluded that play value principles needed to be seen on par with UD principles and facilitate the avoidance of separate or stigmatizing design [44]. A further study did refer to specific UD principles (e.g., low physical effort); however, its application in playgrounds was not necessarily developed [55]. Although UD is recognized to have the potential to support the design of public playgrounds, none of these studies specifically focused on how UD is applied in public playgrounds or the evidence for using UD in public playgrounds to support outdoor play, social participation, and inclusion.

Accessibility and usability were the next most used concepts across five studies [38,42,51,52,84] (Table 3). Specifically, four studies referred to designing for accessibility and usability [38,51,52,84]. Two studies focused only on accessibility [38,51]. One study conceptualized accessibility as gaining physical access to the playground, noting that attention should be given to accessibility early in the playground design process [38]. The other study focused on the provision of a fully accessible playground, noting that part accessibility results in embarrassment [51]. The remaining two studies focused on accessibility and usability in tandem [52,84]. One study identified accessible and usable playgrounds as spaces that bring children together in a way that promotes social inclusion through increasing other children's, and society's in general, awareness of disability-related issues [52]. The other study described accessible and usable playgrounds as catering for all people across the lifespan [84]. A further two studies focused on the outcomes of inclusive playground design by identifying that playgrounds should meet the needs of all children, enable and enhance social participation, noting that this can be achieved by developing inclusive approaches in designing playgrounds [42,44].

The concept of inclusive design was discussed in two studies, who referred specifically to inclusive design as a synonymous concept with UD [75,83]. One study noted that designs that comply with inclusive design criteria (referring to the 7 principles of UD) should consider all children [83]. The remaining study found ten evidence-based practices of inclusive playground design from their review of the literature [75]; however, reference to specific principles of UD was not evident [75]. Although not referring specifically to UD or any specific inclusive design concept, one further study talked about designing for inclusion as an issue of going beyond what is minimally required by law [85].

To summarize, most studies identified physical and non-physical design recommendations as an outcome of the users and providers perspectives to inform the provision of outdoor play for social participation, and inclusion in public playgrounds. Although UD is recognized to have the potential to support the design of public playgrounds, the discourse around UD as a concept or guiding framework in the

included studies is driven more by description and discussion rather than empirical approaches. Specifically, no studies examined UD solutions for playgrounds or tested them for effectiveness. Instead, UD was evident in the discourses around inclusion and design challenges rather than empirical approaches.

Discussion

The aim of this scoping review was to investigate what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD as proposed UNCRPD [68] and GC17 [10]. This review has identified and synthesized all available peer reviewed evidence on public playgrounds in relation to physical design features and non-physical design aspects that facilitate or hinder outdoor play, social participation and inclusion; it provides a broad understanding of how UD, and related concepts, have been conceptualized and discussed in studies of inclusion in public playgrounds in many contexts around the world.

While this study initially aimed to determine what is known about applying a UD approach to support outdoor play, social participation, and inclusion in community playgrounds, the findings showed that we cannot yet determine whether it is an effective design approach as the evidence is currently very sparse. Instead, the review illustrates that research to date has mostly focused on understanding users' perspectives, primarily from adult informants and relating to children with disabilities, with less emphasis on evidence-based practices for inclusive playground design. While this is an important contribution, it also has limits. Notably, most studies relied on the accounts of adult caregivers as a proxy for exploring children's (particularly those with disabilities) perspectives on public playgrounds. Yet, good practice, according to the GC17 [10], is to include children as informants in designing for play. Furthermore, Wenger et al. [64] have recently identified that differences may exist in the way children with and without disabilities experience play activities and how these experiences are often perceived from an adult's perspective in the context of playgrounds. Therefore, multiple studies with diverse children are needed to build knowledge of a user's perspective.

This review identified that to date, no studies have included a focus on the breadth of diverse populations of children at risk of play deprivation (such as migrant children, children from lower socioeconomic communities), implying that inclusion in public playgrounds appears to be considered an issue for children with disabilities primarily. In this way, disability is configured to be an individual problem and continues to limit the potential for UD to enable play equity in public playgrounds. However, having a right to something (play, in this case) also entails "the right not to be marginalized in decision making" [99,p.676]. While the emerging knowledge base is primarily from a user's perspective which provides insights into user-based knowledge, which is essential to enhance UD concepts and application [74], more research is needed to expand such user-based knowledge to include the broader range of diverse groups of children who are identified to be most at risk of play deprivation and ensure this first-person, embodied knowledge continues to build.

However, involving users/experts in general, and disability experience in particular, is not a common practice yet in built environment design [72]. Nevertheless, in recent years, effort has been directed towards the evaluation of playground design from child perspectives. In the Netherlands, for example, "Speeltuinbende" (translated as "the Playground Gang"), consists of a collective of children and adults that test the accessibility and inclusivity of playgrounds [47]. While such initiatives are paving the way forward in terms of including children's perspectives, further efforts are required to include playground users (including children with and without disabilities) in not only the evaluation but also the design of public playgrounds. This study identified multiple stakeholders thought to play an essential role in planning and designing public playgrounds; their participation could be facilitated by using methods from participatory design or co-design commonly used in other design disciplines such as product design [72]. Also, multicultural perspectives, that reflect sociocultural disability-based understandings are necessary to enable UD to reach its full potential as a medium for social justice [11,69].

This review highlights evidence that children, particularly children with disabilities, are often excluded from public playgrounds because of the physical design features and non-physical aspects of playground design. Obstacles in the physical environment

were primarily attributed to the concept of accessibility, which were potentially amplified for the children with disabilities and their families in these studies, as they were precluded access to the playground space or parts of the structure, meaning that they required adult assistance to play resulting in limited social opportunities [43,44,50–52,55,60,61,83]. Thus, social barriers were associated with physical design barriers which shows that the physical environment underpins issues concerning social participation in playgrounds. This finding is supported by a previous finding whereby the physical environment was recognized as a lynchpin for inclusion and social participation in playgrounds [43].

Barriers for playground users were attributed to physical design features of playground design particularly related to accessibility issues. Accessibility has traditionally focused on compliance with official guidelines [100]; indeed, for built environment professionals, the primary source of information into how people interact with and experience the designed environment are building codes or accessibility legislation [72]. Although accessibility standards derive from human consideration, they often translate accessibility into facts (or indicators and averages) [72] and offer little insight as to why a particular building feature is problematic, leading to the inaccurate application [101]. Indeed, the findings uncovered that accessibility pertained to the elimination of barriers in the physical environment, to address disability issues especially for wheelchair users. However, such a focus overlooks other diverse user groups that have a comparable need for inclusion and result in solutions that fall short of the ambition to provide equity of play experience and social participation as envisioned by proponents of UD.

Certainly, evidence from this review confirm that accessibility factors are inadequate for addressing play participation concerning playgrounds. In recognition of this limitation, Lid argues that UD needs to consider the human experience as one shaped by a relationship between individual and environmental factors, and should draw on the situated knowledge of individuals in terms of exploring how people experience the accessibility and usability of design solutions [102]. Unlike accessibility, usability does not focus on compliance with official guidelines; instead, usability is about being able to access and use the environment on equal terms with others, and thus gets closer

to the end goal of inclusion [100]. Nonetheless, and as previously noted in the findings, the terms accessibility and usability are often being used in tandem; however, the two words represent different constructs [100]. Thus, clearer delineation from, or indeed the relationship between, related concepts is needed.

More recently Watchorn et al. [69] contributed further by asserting that if UD is intended to increase social inclusion and wellness, it cannot be limited to personal and environment determinants but instead needs to be more inclusive of the occupations people participate in (i.e., play in playgrounds in this case). Consequently, Grangaard and Gottlieb [103] argue that built environment design needs to shift away from the "black box" of prescriptive requirements that is based on fixated perceptions of users and instead focus on performance-based regulation. In this way, they argue for the contribution from users/experts in identifying solutions and altering or tailoring accessibility regulations rather than merely applying them [103]. In the context of public playgrounds, users/experts have a vital role to play in the design process [72], as they can appreciate qualities designers may not be attuned to [104].

Barriers for playground users were attributed to non-physical aspects of playground design also, namely a lack of knowledge among playground designers/planners/providers that impacted their ability to design/plan/provide community playgrounds that support outdoor play, social participation, and inclusion. Alongside a lack of/weak enforcement of policy and legislation [54,55,85], playground designers/planners/providers were noted to have insufficient knowledge of design for consideration of children with disabilities [38,42,43,50,51,61,85]. This mirrors findings from a municipality in Ireland that found that a lack of knowledge and expertise limited the capacity of providers to establish an evidence-informed approach to inclusive playground provision [11,53]. Among other barriers, funding was also identified as a barrier; providing for children with disabilities or adapting pre-existing playgrounds was primarily seen as an added cost [44,50,55,61,85]. However, more recently, the notion of "added cost" has been debunked in other studies in the international context. Specifically, researchers have determined that designing for inclusion (that is, designing for all) in comparison to specialized design (designing for

some) does not necessarily incur an additional cost, or at least not a substantial cost [11].

However, playgrounds were identified as essential and valued environments for outdoor play, social participation and inclusion among the children, parents, caregivers, educationalists [42,52,55,85], and playground designers/planners/providers in these studies [85]. As an outcome to their studies, researchers were able to identify several enabling design features and factors in the physical and social environments that provided solutions beyond basic accessibility. This scoping review found that physical accessibility is only a basic consideration and designing for inclusion requires three things: 1) design for physical accessibility, 2) design for usability/playability, and 3) design for inclusivity by incorporating design elements in the physical environment that target the social environment, as previously discussed in the findings. Moreover, findings determined that there is a need to provide age-appropriate play opportunities as well as design for risk and challenge. This finding is supported by other international researchers that promote risk-rich [17,44,105] and age-appropriate play options [106,107].

UD was identified as the most common concept utilized across these fifteen studies. UD was recognized to have the potential to support the design of playgrounds that support outdoor play, social participation, and inclusion in seven studies [43,44,51,52,54,55,60], while all fifteen included studies focused on inclusion. However, the discourse around UD in the included studies is driven more by description and discussion rather than empirical approaches. Specifically, no studies examined UD solutions for playgrounds or tested them for effectiveness. Instead, UD was evident in the discourses around inclusion and design challenges rather than empirical approaches. Yet, by utilizing the seven principles of UD as an analytical tool to map the recommendations, it was evident from an analysis of recommendations that the seven principles of UD were represented in the design solutions being proposed. In this way, it was possible to determine that UD is recognised to have the potential to support the design of public playgrounds; however, it must be noted that there are limitations inherent in labelling recommendations that are not born as UD, nor do the interpretations presented here necessarily reflect the original intent. Nevertheless,

what is apparent is that UD is not commonly applied, and thus, new innovations and future iterations of UD as it pertains to playground design is presently lacking because of a lack of maturity in the field. Overall, findings from this study confirms that there is a clear acknowledgement of the potential of UD; however, an articulation of how the application of UD ensures inclusion in play and public playgrounds is yet to be realized.

The challenges in applying the UD principles practically in the context of play has been noted [11,44,53]. Indeed, Theresa Casey, a consultant on children's play and playground design, reviewed principles three and six and identified that "the principles of low physical effort and simple and intuitive use may be deemed to confound the desire for play features requiring progressive levels of physical exertion or offering intrigue and surprise" [33,p.371]. In this way, Casey highlights the need to provide for challenge in children's play, but also identifies the challenges inherent in designing a specific solution than can challenge everyone and thus support their progression. Such a critique offers an interesting and general theme about the interpretation of UD; is UD a single design solution that everybody can use or is UD a plethora of design solutions that enables everybody to choose a solution that fits. Findings from this study would suggest that the latter holds true in the context of play and playgrounds as no one size fits all. Instead, public playground provision requires tailored design solutions that are informed by multiple UD perspectives that meet community needs and wants. Ensuring an inclusive universality in such design efforts requires the incorporation of participatory or co-design approaches that position communities at the heart of the design process.

Yet, the application of UD for playgrounds has been identified as particularly problematic when considering the need to design for play [11,44,53], a subjective experience that defies universality. Even so, attempts have been made to translate and tailor the principles of UD for playgrounds from occupational therapy and occupational science perspectives [44,53], integrating knowledge about play and the environmental affordances rather than architectural design or landscape perspectives. However, there is a clear need to examine UD and consider how the principles of UD can be tailored to include play as a central concern as it relates to playgrounds [13].

Key to this process is expertise in play and how the environment supports and enhances free play, which is the goal of playgrounds. Thus, further research will require a focus on multi- and trans-disciplinary collaboration [11], including, for example, landscape architects, municipality professionals and rehabilitation professionals.

While this scoping review was conducted systematically and rigorously, there are several acknowledged limitations. To maintain the focus of this scoping review, several criteria were put in place that excluded potentially relevant studies. First, the selection of peer reviewed literature as the primary source of the review means its conclusions are drawn from a single genre and may have missed perspectives that challenge the evidence presented here. Second, an assumption was made that school and preschool playgrounds were for private use only unless stated otherwise; this assumption may have overlooked a greater diversity of public playgrounds. Third, double coding was used, but this was led by one author [A.M] because of resource limitations, which limits the reliability of findings. Fourth, the scoping review was limited to articles published in the English language; therefore, evidence published in other languages may have been missed. Fifth, the use of electronic databases to search for evidence may have overlooked a greater diversity of evidence as UD (and related terms) are not commonly found in the subject headings and taxonomies on which they are based [69]. Finally, the low number of studies and heterogeneity in study design is also an acknowledged limitation.

Despite these acknowledged limitations, the body of knowledge presented in this article provides a broad understanding of how UD, and related concepts, are conceptualized for public playgrounds in many contexts around the world. In particular, the review illustrates that research to date has mostly focused on understanding users' perspectives with less emphasis on evidence-based practices for inclusive playground design. While this study aimed to determine whether UD can support outdoor play, social participation, and inclusion in community playgrounds, we cannot yet determine whether it is an effective design approach as the evidence is currently very sparse. Directions to foster inclusive public playground design in the future will warrant enlarging the discourse on UD as it applies explicitly to

playgrounds. Meanwhile, the UNCRPD [68] and GC17 [10] currently place UD practice at the forefront of the political and social agenda of addressing play equity and will continue to ensure that there is a growing awareness of, and demand for playground environments that promote participation and for professionals who are well prepared to take up these challenges.

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Figure Captions

Figure 1: Number of publications in the review period 1988 – November 2019 (n = 62)

Figure 2: PRISMA flow diagram [81] of study selection process

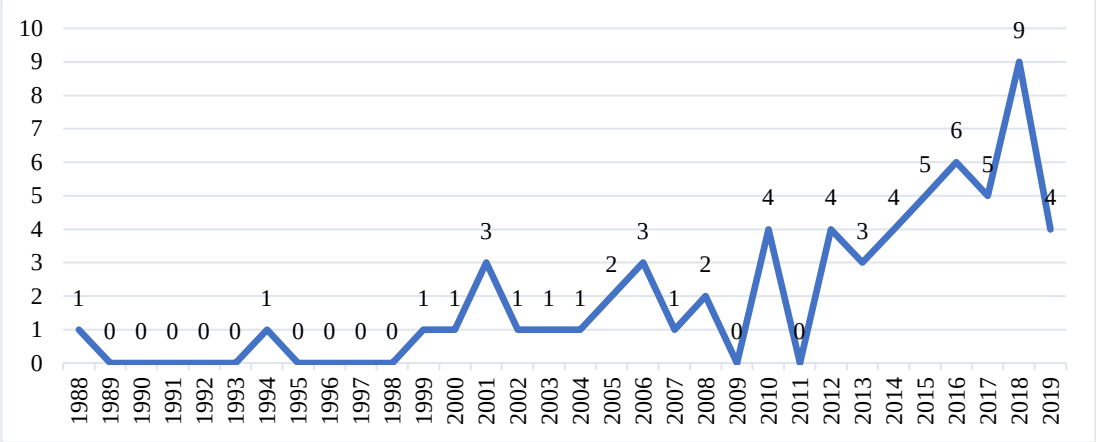


Figure 1: Number of publications in the review period 1988 – November 2019 (n = 62)

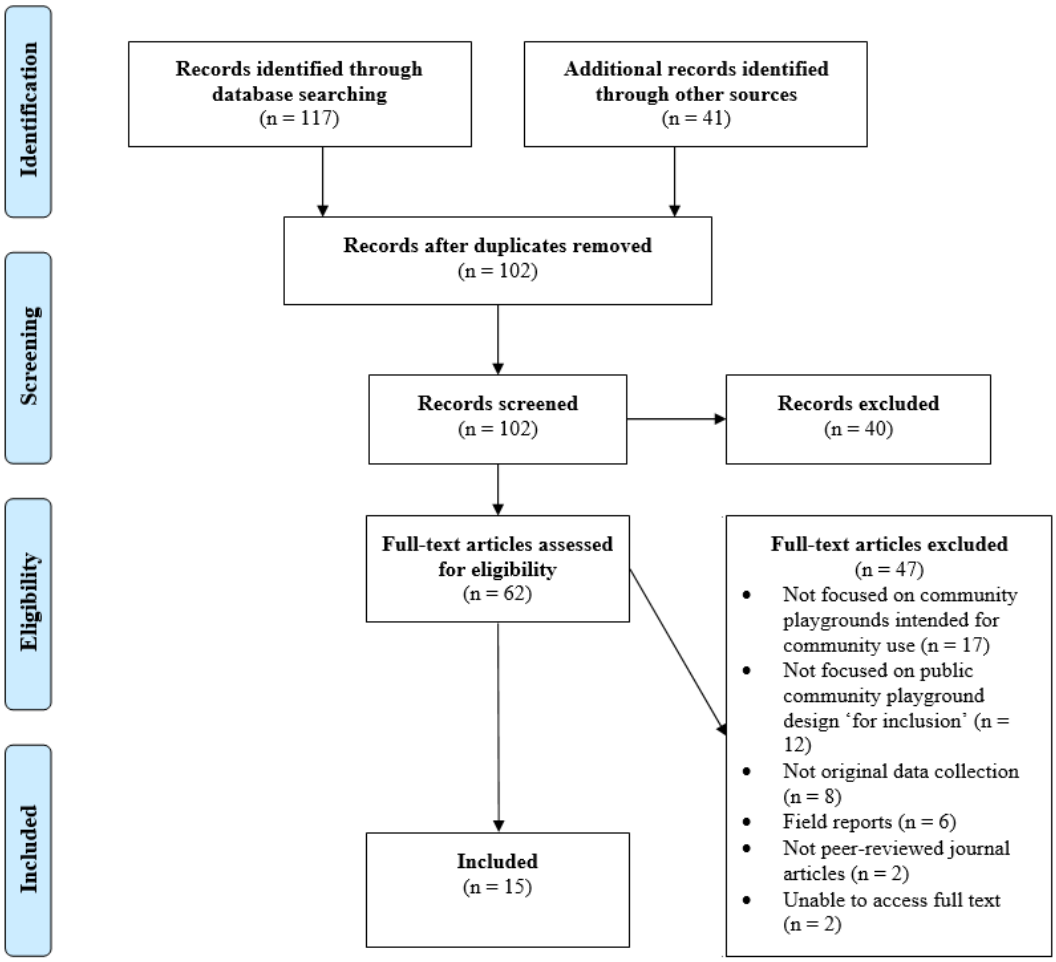


Figure 2: PRISMA flow diagram [52] of study selection process

Tables

Table 1: Primary and secondary search terms

Primary search terms		**Secondary search terms**
playground* OR "play space*" OR playspace* OR "outdoor play space*" OR "outdoor play environment*"	**AND**	universal* design* OR "barrier free design*" OR "design* for all" OR "building* for everyone" OR "access* design" OR "inclus* design*" OR "architect* access*"

Table 2: Scoping review study inclusion and exclusion criteria

Inclusion criteria	**Exclusion criteria**
Included a focus on public playgrounds that are intended for community use.	Childcare/ pre-school/ school playgrounds not intended for community use. An assumption was made that such playgrounds were for private use only unless stated otherwise.
Included a focus on design methods which support inclusion in public playgrounds (see secondary search terms, Table 1). This could include the design of new /pre-existing playgrounds.	Included a focus on the technical aspects of design that do not translate to international contexts (for example, National Standards for safety).
Included a focus on design methods which support participation in public playgrounds as it relates to design for play (for example, Physical Activity as it relates to play).	Included a focus on participation for specific health related outcomes that do not relate to design for play (for example, physical activity for obesity/ BMI/ reducing sedentary behavior).
Included a focus on a review of literature AND/OR the perspective(s) of playground planners/ designers/ providers/ users in relation to accessibility/ usability/ inclusivity of public playgrounds.	Opinion pieces
Published in peer reviewed journals	Not peer reviewed journal articles (book chapters/ dissertations/ theses/ conference proceedings/ reports/ presentations/ posters/ magazine articles/ newspaper articles).
Written in English	Not written in English

Table 3: Geographical location of studies

Geographical location	**Study reference no.**	**n (%)**
Europe		
Sweden	[50,51,60,61]	4 (27)
Ireland	[43,44]	2 (13)
Turkey	[42,83]	2 (13)
United States of America (USA)	[38,54,55,75]	4 (27)
Canada	[52]	1 (7)
Australia	[85]	1 (7)
New Zealand	[84]	1 (7)

Table 4: Study designs

Data collection methods	Study reference no.	n (%)
Single method design		
Interview	[51,60,61]	3 (20)
Survey	[50,54,55]	3 (20)
Literature review	[43,75]	2 (13)
On-site observation	[38,83]	2 (13)
Mixed methods design		
Semi-structured interviews, document reviews and playground observations	[85]	1 (7)
Survey, policy review and a guideline review	[44]	1 (7)
On-site evaluation and classification of geographical deprivation	[84]	1 (7)
Interviews and expressive materials	[52]	1 (7)
Survey and evaluation of physical playgrounds using photos and a checklist	[42]	1 (7)

Table 5: Study populations (n = 1270)

Participants		Study reference no.	n (%)
Parents	Parents of children aged 12 and under with disabilities	[42]	667 (52.5)
	Parents of children aged 5 – 12 years with disabilities *(Visual impairment, multiple disabilities, intellectual disability, autism, mobility impairment, developmental delay, hearing loss, heart murmur)*	[51,52,61,85]	33 (2.6)
	Parents of children aged 14 – 15 years with disabilities *(Mobility impairment)*	[52]	3 (0.2)
Caregivers	Special education professionals (from birth to Grade 6) *(Autism, specific language impairment, developmental delay)*	[54]	303 (23.9)
	Caregivers of children aged 2 – 5 years with disabilities *(Specific language impairment, developmental delay, autism, orthopedic impairment, intellectual disability, other health impairment, behavior disorder, hearing impairment, learning disability)*	[55]	149 (11.7)
	Caregivers of children aged 7 – 11 years with disabilities *(Personal/ school/ educational assistant for children with mobility impairments)*	[52,61]	3 (0.2)
Children	Child participants aged 7 – 12 years with disabilities *(Mobility impairment, visual impairment, developmental disabilities)*	[52,60,61]	20 (1.6)
	Child participants aged 7 – 12 years without disabilities	[60]	5 (0.4)
	Child participants aged 14 – 15 years with disabilities *(Mobility impairment)*	[52]	1 (0.1)
Municipality reps.	Creators of playgrounds *(Landscape architect, Head of Parks Department, park technician, Head of Roads Department, Secretary for the Handicapped)*	[61]	5 (0.4)

	Municipality representatives	[50,85]	58 (4.6)
Other	Members of the Ludi 'Play for Children with Disabilities' COST Action network	[44]	18 (1.4)
	Not-for-profit organization representatives	[85]	2 (0.2)
	Caregiver with a disability	[52]	2 (0.2)
	Sibling of a child with a disability	[52]	1 (0.1)

Table 6: Summary of main findings

Reference and country	Year of publication	Physical design features and non-physical aspects of public playgrounds that facilitate outdoor play, social participation, and inclusion	Physical design features and non-physical aspects of public playgrounds that hinder outdoor play, social participation, and inclusion	Designing for outdoor play, social participation, and inclusion in public playgrounds
Ayataç & Pola [83], Turkey	2016	*Inclusive design features:* Convenient location, equitable access to the park (accessible pathways, ramps with optimal slope and width, stairs located where necessary), inclusive play equipment (e.g., swing for children with disabilities) within the play sections of the playground so children can play with peers (albeit limited), social amenities and green spaces. *For designers/ planners/ providers:* Authorities play an essential role in increasing awareness about disability-related issues and increasing acceptance among residents and society at large and need to pay attention to inclusive design criteria.	*Barriers to users:* Lack of accessibility (ground surfaces such as sand, rubber and rammed earth, stairs at entrances) and lack of inclusive play equipment (inadequate dimensions and limited variety of items) precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities (e.g. where inclusive play equipment exists, it is in isolation from the other equipment) and children requiring adult assistance to play.	Designs that comply with inclusive design criteria (7 principles of UD) should consider all children, including children with disabilities. Specifically, they should: • Be kept simple by eliminating unnecessary complexity and ensure the safety of users. • Ensure equitable access around and within the playground (including access to nearby amenities). • Include inclusive play options that are interesting and intensify the desire to play. • Include signage that addresses different learning styles. • Include equipment that enables children to maintain neutral body posture.

		Research requirements: Further research is required regarding children with disabilities opinions on and expectations from playgrounds and the designs proposed should be grounded on the research performed.		• Provide enough space for children using assisting devices. • Include surface materials that are smooth to allow the use of wheelchairs. • Include paths with different characteristics and width so they can be used by children with different abilities.
Fernelius & Christensen [75], USA	2017	*Inclusive design features:* Circular playground design (ASD studies), equipment designed as commonly recognizable objects, inclusion of loose parts, accessibility features (wide entrances, accessible paths, accessible surfaces, enough space between pieces of equipment, ramps or transfer systems to access elevated items), specific areas (multi-niche settings where children are brought into close proximity, observation points where children can be alone and observe others' play before joining in, comfortable places such as large soft areas where children can move freely and feel	*Barriers to users:* Lack of accessibility (ground cover such as sand or gravel).	Public playgrounds should incorporate inclusive design principles that enable children of all abilities to play together. Specifically, this study found 10 evidence-based practices of playground design that support inclusive play for children with disabilities. These include: 1. Circular playground design that links complementary activities. 2. Playground equipment designed as common and recognizable objects. 3. Loose parts on the playground such as various props for imaginative play, playhouses and tables, sporting equipment, sand toys, musical

		safe) appropriate challenges and risk and sensory elements (sight, touch and sound). In addition to design, other factors include: the type of relationships children with disabilities have with both their peers and staff, the existence of playtimes, the individual routines of the children with disabilities, children's play and social behaviors, how a child with a disability is managed when moving to a new school, staff experience and training, providing lessons to help teach important skills for playing, and children with disabilities having extra time outside or being brought out at the very beginning of the recess period so that they have a better chance of being included. Training should be provided to caretakers, playground staff, and teachers on how to effectively integrate children with and without disabilities.		instruments, and water play opportunities. 4. Accessible surfacing and enough space for maneuvering between and on pieces of equipment. 5. Equal amounts of elevated and ground level items for gathering in groups, and more ramps or transfer systems to access elevated items. 6. Multi-niche settings (equipment/ activities that require more than one child to operate or play). 7. Equipment that provides appropriate levels of challenge and risk for children of all abilities. 8. Observation points or "jump in" points. 9. Comfortable or "cozy" places, often created by enclosed areas or pieces of equipment. 10. Sensory stimulus activities and visual or tactile cues throughout playground.

Lynch et al. [44], Ireland	2018	*Inclusive design features for users:* Regular and accessible pathways leading to all elements in the playground, enough space to access and use play items, provision of alternative routes (such as a ramp) to access the highest point in the playground, provision of inclusive equipment (catering for different sizes and abilities such as swing seats, equipment with recognizable design), design that is simple and easy to understand and accommodates different play preferences and styles (cognitive, sensory, motor and social needs), spaces that accommodate simple repetitive play for children that desire it, appropriate challenges and risk, minimize hazards and maximized safety (contrasting colors, inclusion of boundaries such as fencing, landforms or low hedging), design for low physical effort, space to interact socially and meet up with friends.	*Barriers to users:* Lack of accessibility (absence of pathways leading to play items, lack of alternatives to climbing to access the highest point in the playground), inaccessible play equipment (swings lacking alternative designs such as back and side supports, play equipment that was too small), design for high physical effort (users having to expend unnecessary effort to access or use the playground), segregated or stigmatizing design, complex design and lack of safety (absence of fencing), precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities and children requiring adult assistance to play. *Barriers to designers/ planners/ providers:* children's play as an inter-departmental responsibility, funding, and few national policies exist in the European context that address children's	Taking on the challenge of applying UD in designing for play is an important endeavor to move forward in establishing good practice in inclusive playground provision. The general aim is to avoid design solutions specifically intended for use by people with disabilities to prevent the creation of separate or stigmatizing environments. Ideas of how the 7 principles of UD could be considered alongside play value principles to guide best practice include: 1. Equitable use: need to design for challenge and complexity that caters to people of different ages and abilities, resulting in equality of experience. 2. Flexibility in use: need to design for variety to satisfy people's individual play preferences and styles. 3. Simple and intuitive use: need to design stimulating play spaces that offer opportunities for adventure and excitement.

		Research requirements: Further research is required from the user's perspective, as families of children with disabilities have rarely been involved in researching their preferences on this issue.	play, the inclusion of children in designing for play, or the provision of inclusive play through UD.	4. Perceptible information: need to design play spaces that encourage users' natural curiosity. 5. Tolerance for error: need to design risk-rich play spaces that afford users the opportunity to participate in challenging and risky behavior without being exposed to overly dangerous activities or risks. 6. Low physical effort: need to design play spaces to provide for active play, while minimizing unnecessary fatigue. 7. Size and space for approach and use: need to design play spaces that offer appropriate size and space to accommodate everyone and facilitate participation in the play space.
Moore & Lynch [43], Ireland	2015	*Inclusive design features for users:* Recognizable design features have been identified as more usable, and swings reported as the most usable play items in the playground environment.	*Barriers to users:* Lack of accessibility (ground cover, inaccessible routes and lack of car parking areas close by), inaccessible elevated play items (lack of ramps and transfer systems), ground-level items lack diversity of experiences	• Universal design has the most potential for underpinning the design of publicly funded playgrounds due to its philosophical congruence with the principles of equity and inclusion [35].

		For designers/ planners/ providers: Legislation, policies and standards need to be established to determine what an accessible playground is or should be to enable children to access the social environment on equal terms with peers.	for children, age appropriateness of playground environments (inability to meet the needs of younger and older children in one setting), and lack of safety (shade, high traffic), precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities and children requiring adult assistance to play. Other factors include: socioeconomic status and place of residence can determine the availability and accessibility of playgrounds, children with disabilities having to attend special schools to access services can result in their exclusion from local playground environments due to lack of local friends. *Barriers to designers/ planners/ providers:* Lack of adequate policy and legislation, poorly administered systems of management, attitudinal barriers among fund holders and policymakers, insufficient knowledge of design for	• The involvement of playground users in the designing and planning of playgrounds is an invaluable and under-utilized resource to maximize the inclusion of all children in the playground. In addition, occupational therapists are equipped with the skills and knowledge to advocate for children's occupational right to play and have a crucial role to play in the planning, design, and provision of playground environments.

			consideration of children with disabilities.	
Olsen & Dieser [38], USA	2012	*For designers/ planners/ providers:* Social policies need to be established with a commitment to provide inclusive outdoor playground spaces, responsibility of park and recreation staff to learn about competencies related to people with disabilities, such as UD and playground accessibility.	*Barriers to users:* Lack of accessibility (ground cover such as woodchips or sand, inaccessible routes, designated accessible parking) imbalance between the amount of elevated and ground-level play items, insufficient ramps and transfer systems to access elevated play items and lack of safety (shade) precluded access to the playground space or parts of the structure. *Barriers to designers/ planners/ providers:* Insufficient knowledge of design for consideration of children with disabilities.	• Attention should be given to accessibility early in the playground design process so that activities designed for accessibility provide easy access for and use by wheelchairs [87]. • Accessible structures or trees that protect participants from exposure to the sun are critical items for public playgrounds. Offering places of shade can prevent heat stress, heat stroke or heat exhaustion.
Perry et al. [84], New Zealand	2018	*Inclusive design features for users:* Inclusion of play items (full body support swings, side-by-side slides), support items (accessible car park spaces, accessible routes, seating near the play area, push	*Barriers to users:* Lack of accessibility (car parking spaces, inaccessible routes, high curbs, narrow path widths, irregular path surfaces, lighting), insufficient ramps and transfer systems to access	Parks need to be accessible and usable by all people across the lifespan, including persons with disabilities. Specific design recommendations include:

		button to open restroom doors), safety (fencing). *For designers/ planners/ providers:* Legislation needs to be established so that minimum standards are enforced.	elevated play items, lack of inclusive play equipment (swings capable of fully supporting the user, stimulation for all senses), no area for children and parents that was less stimulating and lack of safety (tactile markings on pathways, fencing, color contrast to demarcate different heights and fall zones) precluded access to the playground space or parts of the structure. Other factors such as a lack of inclusive support items (arm rests on seats, insufficient restroom availability and lacking inclusive features such as automatic doors, drinking fountain availability and capable of serving seated and standing users), socioeconomic status and place of residence can determine the availability and accessibility of playgrounds. *Barriers to designers/ planners/ providers:* Lack of adequate legislation.	• Provision of support items (accessible car parking spaces), play items that provide for auditory, tactile, visual and olfactory stimulation (telescopes, structures with mirrors, high contrasting colors, lights, bells, chimes, talking tubes, sand, plants and flowers are particularly relevant to persons with disabilities as they require minimal physical ability to use and create a range of learning experiences), inclusive play items (full body support swings, side-by-side slides, safety (the installation of fencing should be considered following a risk assessment of hazards, considering all age groups, installation of appropriate lighting in multi-purpose areas [including playgrounds] would better encourage evening use for older children and adults). • Involving persons with disabilities in the planning and design of parks and

				playgrounds has been shown to maximize participation and enjoyment in using such recreational environments [52,88].
Prellwitz & Skär [60], Sweden	2007	All children described playgrounds as a place everyone knew very well and would miss if it did not exist and valued playgrounds for social interaction with peers. They were also seen as an important place to have private conversations, meet friends, or make new friends as well as a space to seek challenges and risks. *Inclusive design features for users:* Swings were described as the most important and usable play equipment, play equipment with recognizable design (such as a house, car, boat, or an animal) promoted role-playing.	*Barriers to users:* For children with disabilities lack of accessibility (ground cover such as sand), play equipment too small (to maneuver around with assistive devices and use), playgrounds located too far from school buildings, lack of simple play equipment, lack of safety (color contrast to demarcate heights and fall zones) and fear of being teased by peers precluded access to the playground space or parts of the structure, adult assistance required to play for children with disabilities. For all children, factors such as limited play items with recognizable design that hold the children's interests for a longer period and changes in their playground (such as removal of play items) made the playground less usable.	• Playgrounds should incorporate UD principles so that children with different abilities can fully enjoy and participate in outdoor play activities. • Instead of concentrating only on playground equipment, measurements, and meeting accessibility standards, it is important to design opportunities for interaction. Incorporating play items with recognizable design not only promote fantasy and role-playing but might encourage more social interaction between children. The children expressed wishes for benches, houses and other equipment at the playground that would support private conversations.

				• Occupational therapists, with their knowledge of environmental barriers, understanding of disability and specific knowledge of activities, are in an ideal position to develop and maximize play activities on playgrounds and to increase their accessibility and usability.
Prellwitz & Skär [51], Sweden	2016	*For designers/ planners/ providers*: There is a need to include parents and children with disabilities as active consultants when formulating policies and laws for accessible playgrounds [4].	*Barriers to users:* Lack of accessibility (ground cover, narrow opening in fences, equipment requiring a lot of climbing), lack of simple play equipment (such as moveable toys or houses, does not require a lot of climbing), lack of safety (color contrast) and segregated design precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities and children requiring adult assistance to play. Additional factors such as disabilities inherent to the child resulted in accessibility barriers. Moreover, increased age and requiring adult	• Advocate for playgrounds built in accordance with UD concepts to promote participation and inclusion. • Provision of an accessible playground (part accessibility results in embarrassment, accessible entry points, design opportunities for interaction with peers), inclusion of simple equipment (such as moveable toys or playhouses for cooperative play, require less climbing), color contrast (for safety and independence). • Change is needed in the way playgrounds are built – society

			assistance to play meant that children with disabilities felt embarrassed, had limited/ unfair opportunities, were denied opportunities to make friends and be independent, and subsequently avoided visiting playgrounds. *Barriers to designers/ planners/ providers*: Insufficient knowledge of design for consideration of children with disabilities	should be responsible for ensuring change occurs not just parents of children with disabilities. • Occupational therapy can contribute through the profession's knowledge of human functioning, disability, and the person-environment interaction by combining population and individualized approaches [89].
Prellwitz & Tamm [61], Sweden	1999	*For designers/ planners/ providers*: Some suggestions were offered that could bring about better knowledge of adaptation. These included: more training of design for consideration of children with restricted mobility and increasing competence by acquiring assistance from other professional groups (e.g. occupational therapists).	*Barriers to users:* Lack of accessibility (ground surfaces such as sand, narrow openings in fences, a ditch surrounding the playground) and inaccessible equipment (routes, height of swings, climbing frame and slide) precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities and children requiring adult assistance to play. Moreover, increased age and requiring adult assistance to play meant that	• Change the ground surfacing by extending pathways so that children can get into the playground and get to the play equipment, accessible surfacing (tiles), support features on play equipment (such as supporting rails).

			children with disabilities avoided visiting playgrounds. *Barriers to designers/ planners/ providers:* Disorganization, insufficient knowledge of design for consideration of children with restricted mobility, costs of designing playgrounds for children with disabilities and attitudes (provision for children with disabilities either not prioritized or not considered because of a lack of awareness).	
Prellwitz et al. [50], Sweden	2001	*For designers/ planners/ providers*: Designers wished for more knowledge of design for consideration of children with restricted mobility. Institutional barriers can be overcome, but this requires that decision makers observe the views of those with limited mobility.	*Barriers to users:* Lack of accessibility (gate difficult to open, gate too narrow, ground surfaces such as sand or gravel, uneven ground, steep gradients, borders in the form of half-buried logs or enclosures with narrow openings) and lack of accessible/ inclusive play equipment (no ramps leading to the play equipment, equipment not designed for children with restricted mobility) precluded access to the playground space	

			or parts of the structure resulting in children requiring adult assistance to play. *Barriers to designers/ planners/ providers:* Disorganization, insufficient knowledge of design for consideration of children with restricted mobility, costs of designing or rebuilding playgrounds for children with disabilities and attitudes (provision for children with disabilities either not prioritized or not considered).	
Ripat & Becker [52], Canada	2012	Families valued playgrounds for child's enjoyment, imagination, and being a part of the social/family experience. *For designers/ planners/ providers:* Families, children and caregivers have valuable information to share about designing usable playground spaces. Moreover, occupational therapists can play a role in advocating for the development of usable playgrounds.	*Barriers to users:* Lack of accessibility (ground surfaces such as sand, gravel, grass and boards/railway ties), lack of usability (where a ramp might exist there were no play opportunities at the top of the ramp), and lack of safety (shade) precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities (e.g. segregation via dual methods of	• Specific features that promote access include accessible surfacing, ramps, pathways, singular usable methods of accessing play items, access to shade. • Inclusivity could be actualized in a playground by considering design-for-disability. Inclusivity was consistent with the principles of UD, specifically the principle of equitable use. • A usable place brings children together to play in a way that promotes social

		Research requirements: Future research needs to examine whether and how usable spaces influence inclusion, play and social opportunities from a child-centered perspective.	accessing items) and children requiring adult assistance to play.	inclusion through increasing other children's, and society's in general, awareness of disability-related issues. • The development of usable spaces for children to play is within the scope of occupational therapists' work.
Stanton-Chapman & Schmidt [54], USA	2016	*For designers/ planners/ providers:* Invite families who have children with disabilities, special education teachers and related services providers (e.g., speech-language pathologists, occupational therapists, physical therapists), physicians, and policymakers to product development meetings. Eliminate or limit the sales representative's profit to be made from the sale of playground equipment. Require playground equipment designers to take child development and special education professional development courses, so that they have the knowledge needed to create equipment that is sociable and playable for children of all abilities.	*Barriers to users:* Lack of accessibility (surfacing that slows children down, ground cover such as woodchips, ramps), lack of usability (where a ramp might exist there were no play opportunities at the top of the ramp), uninteresting environment, lack equipment that challenges children, lack of equipment for younger children (< 5 years), lack of activities the student likes and keeps them engaged for extended periods of time and lack of safety (inappropriate play equipment) precluded access to the playground space or parts of the structure resulting in limited/ unfair social opportunities (e.g.	Demand playground developers and playground equipment companies to go beyond what is minimally required by law (ADA) and focus instead on meeting the principles of UD so that every child is welcomed, and benefits physically, developmentally, and socially. Specific recommendations include: • Design for sociability (opportunities to interact socially with peers) and playability (opportunities to participate in play). • Need to focus on young children (<5 years) with disabilities when developing new playgrounds paying attention to developmental play and the

			segregated design) and children requiring adult assistance to play. *Barriers to designers/ planners/ providers:* Poor enforcement of international and national policies at the community level, building play spaces that comply with the minimum accessibility.	type, scale, and layout of equipment. Include areas to crawl, low platforms with multiple access such as ramps and ladders, ramps with pieces attached for grasping, low tables for sand, water and manipulation of materials, tricycle paths with various textures, flexible spring rockers, sand areas with covers, and shorter slides [86]. • Incorporate activities that involve vestibular, proprioceptive, and tactile input. • Provide for the sensory needs of children (sandbox, musical equipment, architectural panels consisting of vibrant colors and pictures for visual needs or varying textures for tactile needs, and potent smelling plants for olfactory needs) [90]. • Incorporate programs, such as peer buddies/ trained playworkers on playground settings to help children with disabilities play.

Stanton-Chapman & Schmidt [55], USA	2017	Caregivers pursue social participation recreational activities (e.g. visiting the playground) for their toddler or preschool child with disabilities. *For designers/ planners/ providers:* Legislation at the national and local levels are fundamental in facilitating social change to improve playgrounds for children aged 2 – 5 years. Caregivers, advocacy organizations and special education professionals must serve as the 'voice' in public discourse to make change happen.	*Barriers to users:* Lack of accessible equipment (ground level activities not as fun), lack of age-appropriate opportunities (not catering for <5 years), inclusive playgrounds built for older children despite signage stating that it is suitable for children aged 2+, uninteresting, lack of safety (falls from equipment, older children who are larger than toddlers and preschoolers), segregation, fear of teasing/ bullying, feeling frustrated or embarrassed (attitudes of other caregivers toward disability-related issues; need for parents to educate their children on accepting children with disabilities). *Barriers to designers/ planners/ providers:* Limitations of civil rights policies, poor enforcement of international and national policies at the community level, building play spaces that comply with the minimum	Go beyond what is minimally required by law (ADA) when building playgrounds for children of ages 2 – 5 years and include the principles of UD [65]. This means that all children are able to play together on the playground, they can play with the available equipment in a way that works best for them, the playground is safe for all children, and the playground requires low physical effort to access. Specific recommendations include: • Include an inclusive playground for young children (2 – 5 years) only (build a new area for younger kids or fence off an area). • Include play equipment for children aged 2 – 5 years: areas to crawl, low platforms with multiple access such as ramps and ladders, ramps with pieces attached for grasping, low tables for sand, water and manipulation of materials, tricycle paths with various textures, flexible spring rockers, sand

			accessibility, limited funding, societal prejudices.	areas with covers, and shorter slides [86]. • Include play equipment for children aged 5 years and over: rope or chain climbers on an angle, climbing pieces, slides and sliding poles, and horizontal bars [86]. • Include sensorimotor opportunities (music equipment, sandboxes, sensory gardens). • Include opportunities for children with disabilities to develop friendships (YMCA doing a team building activities to encourage [typical] children to play with children with disabilities). • Provide a peer support network for caregivers who have a child with a disability to enhance caregiver self-esteem and social functioning. • Need for parents to educate their children on accepting children with disabilities.

Sterman et al. [85], Australia	2019	Parents actively planned for and supported their children's outdoor play participation, families valued parks and playgrounds that are well designed, and everyone uses it (e.g., sand pits that accommodate wheelchairs), playgrounds within walking distance, community support (inclusion and acceptance). *For designers/ planners/ providers:* Valued playgrounds as community meeting spaces, educational campaigns around disability awareness and stigma reduction, consultation with communities about preferences and needs and integrating social interaction into a playground to support feelings of acceptance. Government should support familial and community agency to advocate for their own needs. *Research requirements:* Future research should seek to understand local government organizational structures, and	*Barriers to users:* Lack of accessibility (getting there is too hard), lack of usability, absence of design elements to support social or physical inclusion, accessible playgrounds deemed unenjoyable or uninteresting, social stigma. *Barriers to designers/ planners/ providers:* Insufficient knowledge of design for consideration of children with disabilities (other than physical disability), building play spaces that comply with the minimum standards (safety and disability access), interpretation and implementation of safety standards (limiting nature play, sterile and uninteresting environment), budget (provision and adaptation of playgrounds), attitudes (provision for children with disabilities either not prioritized or not considered, Western view of disability), lacked sensitivity to the culturally and linguistically diverse	When communities are involved in design then they feel more ownership, and the resulting park is more likely to meet or exceed their expectations. Local governments must solicit family perspectives in ways that are meaningful to them and on engage in topics relevant to their lives. Health providers such as occupational therapists can play a key role in this process. Rather than only addressing physical access to a minimum requirement, government can support social inclusion in playgrounds in several ways. Specific recommendations include: • Spaces that are truly natural can increase creativity [91] and physical accessibility [92] and decrease maintenance costs. • Fences can provide barriers that ameliorate parental fears around children being injured by traffic, which

		determine the decision-makers in relation to children's services	nature of the community (challenges with community engagement).	is not restricted to children with disabilities [93,94]. • All children may need spaces within the playground to retreat to when overwhelmed [95]. • Materials and equipment that support social interaction and challenge across developmental levels (e.g. construction, pushing large items for cooperative play, water, or sand play) may support continued engagement [23,96] • To support a sense of community belonging with families, playgrounds should offer structural support such as family bathrooms with large changing tables, shade, and picnic tables [97].
Talay et al. [42], Turkey	2010	Families pursue visiting playgrounds for their child with disabilities and encourage their children to play with other children. *For designers/ planners/ providers:* Legislation regarding physical	*Barriers to users:* Lack of accessibility, lack of safety, lack of municipal support, lack of inclusiveness, others' negative views of disability (communities lack of information, education, and awareness),	Playgrounds should meet the needs of all children, enable, and enhance social participation. This can be done by developing inclusive approaches in designing the playgrounds.

		environment should be carefully implemented. Local governments should be supported through scientific/ academic studies and financially. Local governments should be informed about disability-related issues as they pertain to playground design. There is a need to bring persons into contact that possess knowledge as well as users.	perceptions of not being accepted, limited/ unfair social opportunities. *Barriers to designers/ planners/ providers:* Insufficient knowledge of design for consideration of children with disabilities.	Specific recommendations include: • Design for social interaction and playability (accessible playground equipment). • Never target the creation of spaces designed specifically for children with disabilities but make suitable the existing spaces for common use. • Accessible paths should lead to the playground. Accessible surfacing such as rubber tiles rather than gravel or sand. • Effective interventions to increase the social interactions between children with and without disabilities must be developed and implemented in playgrounds [98]. • Some physical and social barriers exist; determining these barriers will help to increase possibilities and afford children the right to play in an environment without such barriers. • Playground toys should be safe, durable, versatile and accommodate

				different ages, abilities, and interests [40]. Playground toys should encourage social interaction. • Awareness rising and changing attitudes of the children without disabilities towards children with disabilities.

Chapter Four: Study II, Paper II

Moore, A., Boyle, B., & Lynch, H. (2022). Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of universal design. *Disability and Rehabilitation: Assistive Technology*. Advance online publication. https://doi.org/10.1080/17483107.2021.2022788

The first scoping review study (Study I, Paper I) revealed that numerous non-discriminatory planning and design concepts are used in peer reviewed studies exploring public playground design for inclusion, and concluded that clearer delineation from, or indeed the relationship between, related concepts is needed. Therefore, responding to the overall aim of this thesis, and informed by emergent findings, this second scoping review study (**Study II, Paper II**) aimed to review the conceptual understanding of UD in public playground design. Specifically, the aim was to examine how UD, and related non-discriminatory planning and design concepts, have been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion (**Study Aim 2**). While UD has been the focus of research pertaining to public playgrounds, for the first time, this review provides an analysis of how UD and related design concepts are represented amongst researchers internationally.

With supervision and guidance from her supervisory team (Dr Bryan Boyle and Dr Helen Lynch), the research design, data collection, data extraction, and data analysis were conducted by the PhD candidate. The PhD candidate wrote this paper with supervisory support and mentorship from her supervisory team. This study was published online by the Disability and Rehabilitation: Assistive Technology Journal on 09 February 2022 following two rounds of revisions in response to peer review feedback. Revisions included further critical engagement with UD discourses and the provision of further context on whose voices are dominating the discussions on UD.

The study is presented here as it appears in print; thus, as before, there is some overlap with the previous sections of this thesis. The figures and tables are presented at the end of the chapter.

Title

Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of Universal Design

Abstract

Purpose: Public playgrounds afford children and families important opportunities for outdoor play, social participation, and inclusion. Unfortunately, many children and families experience barriers to accessing, using, and being included in public playgrounds. Consequently, Universal Design (UD) is promoted for providing conceptual guidance for designing for inclusion in public playgrounds. However, a lack of research evidence means researchers have engaged in the ongoing interpretation of the UD concept and related non-discriminatory planning and design concepts. Therefore, the aim of this study was to examine how UD, and related concepts, are used in peer reviewed articles concerning public playgrounds.

Materials and methods: A scoping review was conducted in November 2019, which identified 15 peer reviewed articles that met the inclusion criteria.

Results: Analysis revealed that the terms UD, inclusive design, accessibility, and usability are all being used to describe non-discriminatory planning and design concepts arbitrarily and without regard for higher or lower order concepts. Two broad interpretations were evident: (a) UD is synonymous with accessibility for some, and (b) UD is a higher-order concept that goes beyond accessibility for others. Nevertheless, findings highlight the utility of UD in underpinning the design of public playgrounds in many developed countries; however, the concept requires further clarity and specificity as it pertains to playground design and more pertinently inclusion in outdoor play.

Conclusions: We argue for further conceptual refinement to consolidate the importance and future application of UD for Play (UDP) in the design of public playgrounds that promote outdoor play, social participation, and inclusion.

Implications for rehabilitation

- Most peer reviewed journal articles reviewed fail to define what is meant by the term Universal Design.

- Of those that do provide a definition, the outcome of inclusion in play, or the application of Universal Design to enable play in public playgrounds was unclear.
- Research to date has mostly focused on related concepts, including accessibility and usability, with less emphasis on Universal Design.
- Recommend a tailored perspective of Universal Design for Play (UDP).

Keywords
playground; universal design; inclusive design; accessibility; usability

Main text introduction

Play is formalized as a fundamental human right of all children in article 31 of the United Nations Convention on the Rights of the Child [1]. Though ambiguity exists in terminology, for this paper, play is defined as "any behaviour, activity, or process initiated, controlled and structured by children themselves; it takes place whenever and wherever opportunities arise" [2,para.14c]. Within the play domain, outdoor play, or playing outdoors, is considered a "natural and critical part of a child's healthy development" [3]. Researchers have attributed a myriad of social, emotional, cognitive, and physical benefits for children engaging in outdoor play that is less supervised, less structured, more adventurous, and includes elements of challenge and risk [4–8]. Moreover, outdoor play has also been related to numerous health and wellbeing outcomes; these include positive effects on cardiorespiratory fitness [9] and cardiovascular and metabolic health biomarkers [3], together with overall health [4,10], wellbeing [11], and quality of life in children [12].

Nonetheless, the design of built environments influences people's health, social participation, and attainment of human rights [13]; therefore, the quality and benefits of play are highly susceptible to the environments in which it occurs [2]. Although children's outdoor play takes place in many environments outside [14,15], public playgrounds, the focus of this paper, afford children and families important opportunities for outdoor play, social participation, and inclusion [16–18]. Public playgrounds are generally located in neighbourhoods or at locations that playground users drive or take public transportation to [19] and usually contain play equipment

and structures with paths to and between equipment [20]. In playgrounds, play is largely unstructured, and consequently, children have opportunities to advance their self-awareness, imagination, risk perception, and identity, as well as develop their motor and social skills [21,22]. The problem, however, is that many children and families are not afforded opportunities to capitalize on the benefits of participating in public playgrounds due to tensions between children's play needs and the formal, managed, play environments typically designed and planned by adults [23]. This may be due to issues relating to impairment, gender, poverty, or race among others [2]. Consequently, many children and their parents' experience physical barriers to access and social barriers to participation [21,24–28], meaning that access to public playgrounds is limited and the play opportunities are not inclusive.

Still, the right to play and access the physical environments (including play environments) is enshrined in article 31 of the United Nations Convention on the Rights of the Child [1] and further supported in article 9 (among others) of the more recent United Nations Convention on the Rights of Persons with Disabilities [29]. Thus, having opportunities to play and access play environments must be afforded to all children and families [30]. Despite these international declarations of human rights, problems in implementing these rights led to the publications of General Comment No. 17 on play and leisure [2] and General Comment No. 2 on accessibility [31]. Both General Comments endorse Universal Design (UD) for providing conceptual guidance for designing environments that are inclusive of all. As such, play researchers internationally have promoted UD for developing and providing public playgrounds that support outdoor play, social participation, and inclusion [14,21,25,26,32,33], to address substantial barriers that both children and their families experience [23,25], and reframe playground design as "the architecture of social participation" [13,34].

Rooted in architecture and environmental design, the term "UD" was initially coined by Ronald L. Mace, an influential architect, product designer, and educator, in 1985 to denote: "a way of designing a building or facility, at little or no extra cost, so that it is both attractive and functional for all people, disabled or not" [35]. One of the most repeatedly cited explanations of the concept of UD is the seven principles (equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for

error, low physical effort, and size and space for approach and use), developed in 1997 by the Centre for Universal Design with a group of US architects, product designers, engineers, and environmental design researchers [36], to further elaborate on the concept. In recent years, UD has "acquired global significance and become the orthodoxy of what is presented as the very best of design practice" [37,p.873]. This is emphasized by the inclusion of UD in the United Nations Convention on the Rights of Persons with Disabilities whereby UD is described as "the design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" [29,p.3].

Despite such endorsement, Rob Imrie [37], a professor of sociology in the UK that has published widely on issues relating to architecture, urban design, and urban politics, criticized that the inclusion of the term "without" in the definition of UD appears to discount particular and individual-specific design elements or features that may be interpreted as assistive in relation to any type of disability. In this way, Imrie articulated that the UD concept has tensions and contradictions, between, providing designed environments that supposedly cater to all, and, ensuring that such environments are sensitized to users that are not easily met by universal solutions [37]. Moreover, Jim Sandhu [38], a professor in inclusion research in the UK, argued that there was little universality in developing the concept of UD and "not only is the link between demographics, legislation, and economics deficient but there is also an underlying assumption that there is somehow a United Nations of universal design to which all should subscribe" [38,p.44.5]. Additionally, Imrie and Hall [39] argued that UD is too idealistic and does not reflect the political nature of the process of inclusion.

Considering these issues, in 2012, Edward Steinfeld and Jordana Maisel, professors and director (ES) and research director (JM) of the Centre for Inclusive Design and Environmental Access (IDeA) in the US, proposed eight goals of UD (body fit, comfort, awareness, understanding, wellness, social integration, personalization, and appropriateness) and a refined definition for UD as "a process that enables and empowers a diverse population by improving human performance, health and wellness and social participation" [13]. The refined definition is explicit about the outcomes of UD (i.e., improved health and social participation) and recognizes that inclusion must

address the full diversity of the population. Thus, UD as a concept has evolved beyond a focus of removing barriers, to also being about creating the right environmental conditions for inclusion and social participation that consider the breadth of all human abilities and functions.

Before the international endorsement of the concept of UD, a variety of related non-discriminatory planning and design concepts like “barrier-free design”, “accessible design”, “inclusive design”, and “design for all” were prominent across the body of literature on playgrounds [20,21,25,26,32–34,40–48]. The first two concepts precede the UD concept and are associated with negative connotations of designing for a sub-set of the population (i.e., persons with disabilities) [49,50]. According to Ann Heylighen, a professor of design studies in Belgium, and colleagues [51], "inclusive design" and "design for all" concepts are synonymous with UD and noted that despite different places of origin and some semantic distinctions, all concepts share a similar purpose—of recognizing the broad spectrum of human abilities and including as many people as possible. Indeed, the “inclusive design” concept is the preferred concept in the UK [39,51,52]; and in addition to inclusive design, the “design for all” concept has become prevalent in the UK and much of northern and central Europe [49,51,53].

Nonetheless, and despite its critique, the UD concept has been identified as the way forward for best practice in designing for inclusion in playgrounds [2]. As such, the varied use of terminology across research and practice contexts has resulted in difficulties in synthesizing the body of knowledge for UD, and subsequently barriers to translating it into evidence-informed playground design. Therefore, there is a need for a comprehensive examination of how UD, and related non-discriminatory planning and design concepts, are represented in peer reviewed articles with a view to better understanding how these design concepts contribute to the design of public playgrounds that support outdoor play, social participation, and inclusion. Hence, the aim of this study was to conduct a scoping review to carefully examine how UD, and related non-discriminatory planning and design concepts, are used in peer reviewed articles concerning designing for outdoor play, social participation, and inclusion in public playgrounds.

Materials and methods

Based on the study aim, a scoping review was determined to be the most appropriate method. The aim was too broad to address via a traditional systematic review (and meta-analysis) and could be more appropriately answered through mapping the extent, range, and nature of a body of peer reviewed literature, summarizing and disseminating research findings to date, and identifying research gaps in this area; all of which are common scoping review purposes [54,55].

To ensure robustness, the methodology for this scoping review was based on an established framework outlined by Arksey and O'Malley [54] and ensuing recommendations made by the Joanna Briggs Institute [55] and other researchers [56]. The framework includes the following phases: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results, described below with specific reference to their application to this study. The non-compulsory "consultation exercise" of the framework was not performed.

Phase 1: Identifying the research question

This review was guided by the following questions:

1. How is UD, and related non-discriminatory planning and design concepts, used in peer reviewed journal articles concerning designing for outdoor play, social participation, and inclusion in public playgrounds?
2. By whom, and for what purpose, is UD, and related non-discriminatory planning and design concepts, used in peer reviewed journal articles concerning designing for outdoor play, social participation, and inclusion in public playgrounds?

Phase 2: Identifying relevant studies

Following consultation with an expert librarian, the search was implemented in November 2019. We identified relevant studies by searching eleven electronic databases (full list of databases searched can be found in Table 1) and hand-searching reference lists of key studies.

Databases were searched for titles that contained at least one “playground” term as well as at least one “non-discriminatory planning and design concepts for built environments” (a full list of search terms can be found in Table 1). Appropriate Boolean operators were used to account for search term variations and maximize searches. This database search generated 117 potentially eligible studies after duplicates were removed. At this stage, the reference lists of identified studies were hand-searched to identify additional literature. This hand search yielded a further 41 studies.

The database search was designed to be as comprehensive as possible with the available resources. Specifically, no limits on a date or geographic location were placed on the database search; however, articles needed to be written in English, published in peer reviewed journals, and available in full text (a full list of inclusion and exclusion criteria can be found in Table 1). Therefore, it is important to note that these limits result in omitting the greater body of evidence that potentially exists on this topic.

Phase 3: Study selection

All identified studies were uploaded to EndNote X9 (2019) reference management software. All three authors independently screened titles and abstracts. After removal of duplicates and exclusion of studies based on title and abstract, 62 studies proceeded to full-text review. Full-text level reviewing was carried out by two independent researchers [A.M. and H.L.] corresponding with the inclusion criteria. The additional validation process was then conducted, where all included studies, and one-fifth of the excluded studies were randomly selected and reviewed by a third researcher [B.B.]. See Figure 1 for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [57] study selection flowchart.

Phase 4: Charting the data

Data were extracted into a specifically designed Excel spreadsheet for charting the data. Where available, the data charted included: reference and country, year of publication, author(s) discipline(s), terminology, and definition/description of

terminology used (see Table 3). All data were then critically analyzed via thematic analysis [58].

Phase 5: Collating, summarizing, and reporting the results

To address our research question and maximize relevance for policymakers, practitioners, researchers, and other relevant stakeholders, findings of this scoping review were reported in two ways: (1) through a descriptive numerical analysis of the evidence characteristics, and (2) through a narrative summary of the evidence base.

Methodological limitations

Measures were embedded throughout this study's design to ensure the findings are rigorous and credible. Nevertheless, there are some acknowledged limitations. Specifically, the selection of peer reviewed journal articles, published in English, as the primary source of the review means that the data for analysis is limited by these factors. The authors acknowledge that conference proceedings, grey literature, and literature published in other languages would contribute more expansively to the debate than is possible to do here. However, to echo Heylighen et al.'s [51] observation, the innate diversity within the concept of UD presents challenges to anyone seeking to obtain a comprehensive overview. Moreover, the use of electronic databases to search for evidence may have omitted a greater diversity of evidence as UD, and related concepts, are not typically used in the subject headings and classifications of electronic databases [59].

Results

A final sample of 15 peer reviewed journal articles published between 1999 and 2019 met the inclusion criteria for this scoping review, with twelve of the articles identified published in the past 10 years (see Figure 2).

Descriptive numerical analysis of evidence characteristics

As shown in Table 3, the sample of peer reviewed journal articles in this review (n = 15) is varied regarding disciplinary backgrounds and the ways in which UD, and related non-discriminatory planning and design concepts, are used.

Articles in this review originated from several developed countries, from northern and southern hemispheres, across continents of Asia, Australia, North America, and Europe, namely, Sweden (n = 4, 27%), US (n = 4, 27%), Ireland (n = 2, 13%), Turkey (n = 2, 13%), Canada (n = 1, 7%), Australia (n = 1, 7%), and New Zealand (n = 1, 7%) (see Table 2). While built environment disciplines, such as architecture, planning, and landscaping were present within this literature (n = 5, 33%), health disciplines made the most significant contribution (n = 10, 67%). Early childhood education scholars were also present (n = 2, 13%) (see Table 3). Given the dominant presence of health disciplines, it is perhaps unsurprising then that most of the 15 peer reviewed journal articles were published in health and medical science peer reviewed journals (n = 9, 60%), including Occupational Therapy (n = 5, 56%) and disability studies (n = 4, 44%). The remaining six peer reviewed journal articles were published in architecture, urban environment, and environmental sciences (n = 3, 20%) and social sciences (n = 3, 20%).

All 15 peer reviewed journal articles included in this review examined the connection between inclusion and design in public playgrounds. A combination of single method approaches [21,28,40,43,44,46–48,60,61], and mixed methods approaches [18,24,27,34,62] were employed; however, a common approach across the included peer reviewed journal articles was to employ qualitative methods to examine users' perspectives [18,24,27,28,43,46,47], or review the built environments [18,60–62]. Nonetheless, the discourse around UD and related non-discriminatory planning and design concepts in the articles was generally driven by description, discussion, and commentary, rather than empirical approaches; specifically, no articles addressed the outcomes of design, to examine effectiveness. The specific intricacies relating to study populations, study design, and findings pertaining to design considerations for public playgrounds that facilitate/hinder outdoor play, social participation, and inclusion are beyond the scope of this paper and reported elsewhere [25].

Multiple terms were used to describe UD and related non-discriminatory planning and design concepts, generating a degree of inconsistency and confusion. The terms utilized across the peer reviewed journal articles included in this review were: accessibility (n = 15, 100%), usability (n = 9, 60%), UD (n = 9, 60%), and inclusive

design (n = 6, 40%) (see Table 3). Thus, research to date has mostly focussed on non-discriminatory planning and design concepts that consist of inter-related concepts, including accessibility and usability, with less emphasis on UD.

Despite multiple terms being used to describe UD and related non-discriminatory planning and design concepts, observable disciplinary patterns were noted among the 15 peer reviewed journal articles included. For example, authors from health science disciplines frequently cited Iwarsson and Stahl's [63] definition of accessibility and/or usability [21,24,40,62]. Similarly, authors from health science disciplines commonly defined what was meant by UD [21,24,28,34]. Also, authors from built environment disciplines regularly used the term inclusive design [18,48,61] (see Table 3).

Narrative summary of main results

Three themes were identified via thematic analysis. The first theme describes definitions, interpretations, and utilization of UD as it relates to public playgrounds. The second theme addresses related design concepts used to describe the concept of designing for outdoor play and social participation in public playgrounds. The third theme reflects the core concept of inclusion that underpinned all peer reviewed journal articles irrespective of what design concept was adopted.

Theme 1: Definitions, goals, and principles of UD as it relates to public playgrounds

Although all 15 peer reviewed journal articles addressed outdoor play and inclusion, UD was not the dominant design concept for public playground design. Specifically, accessibility and usability were more frequent terms used, with only nine of the peer reviewed journal articles that originated from Sweden, US, Ireland, and Canada, referring to UD as the concept or guiding framework for playground design. The remaining six peer reviewed journal articles that did not explicitly include a focus on UD were still included in the study because the studies referred to related terms (inclusive design, accessibility, and usability), consistent with supporting outdoor play, social participation, and inclusion in public playgrounds, as envisioned by the proponents of UD (Table 3).

When UD was used, authors seldom defined what was meant. Of the nine peer reviewed journal articles that referred to UD, only five provided definitions of UD (see Table 3). For those that did define what was meant, it was primarily health and education professionals; in essence, they included descriptive definitions of UD as a concept or guiding framework for playground design. However, the outcome of inclusion in play, or the application of UD to enable outdoor play, social participation, and inclusion in public playgrounds was not clearly established. Instead, explicit reference was made to the aims/goals of UD and its importance in catering for diversity and providing equal opportunities for all [21,24,28,34,46].

The aims/goals referenced included promoting usability [21,34], supporting participation and inclusion [28,46], promoting equal rights and opportunities for all [28], promoting accessibility [24], as well as understanding that people are different, and environments should afford different opportunities and solutions [28]. Despite many aims/goals being articulated, only one article [34] made explicit reference to the eight goals of UD [13]. No studies had a goal relating to play, although one study recognized the need to consider play value principles alongside UD principles to maximize the possible partnership of UD and play value [34]. In this instance play value referred to fun and engaging environments that promoted outdoor play, social participation, and inclusion.

Moreover, and despite referring to many of the underlying philosophies and goals of UD, only two peer reviewed journal articles [34,46] referred to the commonly accepted seven principles of UD [36]. One peer reviewed journal article described the UD principles as going beyond what is minimally required by law so that all children are welcomed in the playground and benefit physically, developmentally, and socially [46]. In contrast, the other peer reviewed journal article described the seven principles of UD as a point of reference to examine existing designs, guide the design process and act as a source of information on designing more usable products and environments [34], and further tailored the UD principles to include play as a central concern as a way of exploring the potential application of UD in designing for outdoor play, social participation, and inclusion in public playgrounds. The rationale for adapting the UD principles was based on the challenge of using these principles from

a play value perspective, whereby ensuring a design is simple and intuitive for example, may limit the play value for many children.

Rather than focussing on UD, authors from architecture/planning backgrounds instead referred to "inclusive design" [48,61], using the term synonymously with UD hence the emergence of theme 2, presented next.

Theme 2: Related design concepts used to describe the concept of designing for outdoor play and social participation in public playgrounds

Where UD was not used, related concepts were evident, with many authors referring to inclusive design, accessibility, and usability, consistent with supporting outdoor play, social participation, and inclusion in public playgrounds. These related concepts were evident across all 15 peer reviewed journal articles, with many referring to the term's accessibility and usability (see Table 3). While inclusive design was used synonymously with UD, no studies utilized the five principles of inclusive design as promoted by the Commission for Architecture and the Built Environment (CABE) [64].

Whereas all studies considered accessibility as a basic issue, only six peer reviewed journal articles provided definitions of accessibility for their studies (see Table 3). From the six definitions that were provided, four peer reviewed journal articles focussed on accessibility as it related to the physical environment [40,48,61,62]. Accessibility has traditionally been associated with compliance with official guidelines for ensuring the built environment is designed to be accessible for all users, including those who use wheelchairs, or mobility aids [63]. However, two peer reviewed journal articles focussed on physical accessibility as it related to the social environment [24,28], pointing to the issue of physical accessibility being fundamental for accessing the social environment.

Additionally, nine peer reviewed journal articles referred to the usability (see Table 3). Unlike accessibility, usability does not focus on compliance with official guidelines; instead, usability refers to being able to access and use the environment on equal terms with others and thus gets closer to the end goal of inclusion [63]. This

finding was supported in the definitions provided; usability was conceptualized as a design whereby children could not only access the playground but also use the playground in the same way as other children [21,24,40]. Thus, the importance of what children could do in the playground (i.e., play) was prioritized. Moreover, the same studies introduced concepts, such as equity. A further study referred to usability as a measure of effectiveness, efficiency, and satisfaction [62], pointing to the subjective nature of usability.

Theme 3: Inclusion and public playgrounds

The third theme reflects the core concept of inclusion that underpinned all 15 peer reviewed journal articles irrespective of what design concept was adopted. Specifically, inclusion was identified as a common goal or priority for public playgrounds across peer reviewed journal articles that used and did not use UD as the guiding concept. Yet, few studies articulated what was meant by inclusion.

While eleven of the included peer reviewed journal articles referred specifically to the term inclusion (Table 3), only one peer reviewed journal article defined inclusion [48]. Drawing on the definition proposed by Mejeur and colleagues [65], Fernelius and Christiansen [48] defined inclusion on the playground as an environment whereby all children have equal access and opportunity to engage in both play and social interactions. From this definition, inclusion was conceptualized as providing equal opportunities for all children to participate in both the physical and social environments of the playground. While inclusion from this definition referred to all children in terms of age, gender, ability, etc., it did not include intergenerational inclusion. Similarly, the remaining ten peer reviewed journal articles that referred specifically to the term inclusion articulated inclusion primarily as providing equal opportunities for children to participate in both the physical and social environments of the playground. Specifically, four peer reviewed journal articles conceptualized inclusion as promoting equal opportunities for all [21,34,40,46], one peer reviewed journal article conceptualized inclusion as providing a space whereby all children could play together and feel included [61], and one peer reviewed journal article conceptualized inclusion as promoting usability [24].

The fact that only four peer reviewed journal articles conceptualized inclusion as promoting equal opportunities for all is a worrisome finding given that play is an unconditional and absolute right, as laid down in the United Nations Convention on the Rights of the Child [1]. Moreover, three peer reviewed journal articles conceptualized inclusion as providing for children with disabilities, namely, promoting accessibility [60] and including children with disabilities [18,27]. However, demarcation towards one group (i.e., children with disabilities), results in segregation and stigmatization as opposed to promoting inclusion. One further peer reviewed journal article referred to inclusion in the context of fencing in a playground when discussing park and playground users that may wander or run [62]. In this way, inclusion was considered in terms of safety, and thus adds a further dimension to inclusion as it pertains to play and play environments.

Discussion

Summary of principal results

The aim of this scoping review was to comprehensively examine theoretical concepts that inform our understanding of designing for inclusion in public playgrounds, and to examine how the concept of UD is being applied, by whom, and for what purpose. Across the 15 peer reviewed journal articles identified for this review, findings demonstrate that the discourses around UD and public playground design are diverse and unclear, as the terms UD, inclusive design, accessibility, and usability are all being used arbitrarily. Also evident was the lack of regard for higher or lower order concepts, which has potentially led to further inconsistency and confusion. Thus, the multiple terms, and usage of concepts arbitrarily, shows the youth of the approaches and the need for further development and research to acquire some common understanding.

Moreover, much of the discourse reviewed here focussed on making public playgrounds accessible to meet the needs of sections of the population (i.e., persons with disabilities), leading to an incomplete representation of UD, and subsequently what children could do in the playground (i.e., play) was not prioritized. Specifically, two broad interpretations were evident: (a) UD is synonymous with accessibility for some authors, and (b) UD is a higher-order concept that goes beyond accessibility for others. It is important to confirm that accessibility is considered an essential dimension

of UD and provides a critical contribution to supporting participation in public playgrounds for segments of society that are often overlooked (e.g., children with motor and physical disabilities and their families). However, addressing accessibility factors alone provides a solution that falls short of the ambition to provide equity of play experience and social participation as envisioned by proponents of UD [46,47]. The outcome of inclusion is therefore not achieved when accessibility alone is addressed, and children and their families are still excluded on playgrounds as has been noted elsewhere [26,41].

Consequently, from the data analysis of these 15 peer reviewed journal articles, the interchangeable use of concepts, such as accessibility, usability, and inclusion represents a discourse that lacks congruency. This may be due to the diverse disciplines involved, which have been shaped by different theoretical influences. Nonetheless, while the concept of designing for inclusion was indeed a common goal across all 15 included peer reviewed journal articles, the vision of, and means to achieve inclusion clearly lack consistency in terms of theoretical grounding. If UD is to take its place as the endorsed solution for enabling inclusion in designing for all, more efforts are required to embed and advance the theory of inclusion, with the vision and concepts of UD, among diverse disciplines and stakeholders who are involved in research and provision for play in public playgrounds.

Despite this limited understanding, findings highlight that UD as a higher-order concept that goes beyond accessibility has utility for underpinning the design of public playgrounds in several developed countries, namely, Sweden, US, Ireland, and Canada. In each case, UD served to guide the study of play in playgrounds, from a more robust theoretical approach to inclusion, that considered the provision of equal opportunities alongside diversity among child population, and according to how the design enhanced play value, based on principles of equity of experience, social participation, and belonging. However, few peer reviewed journal articles articulated what this means for public playground design and had not researched the impact or outcome of using UD concepts in design. Thus, we cannot yet determine whether UD can provide equity of play experience and social participation if we do not fully

understand the application or cannot clearly define the concept as it relates to public playgrounds.

Fundamentally, a significant challenge identified included a lack of a comprehensive definition of what an inclusive playground is or should be. Inclusive playgrounds were primarily examined as spaces designed to support the inclusion of children with disabilities, with little regard for what inclusion is or how best to support the participation of all public playground patrons. For example, no studies addressed inclusion as an intergenerational issue although playgrounds have been identified as sites for intergenerational use [34,66]. Therefore, the question persists; if a lack of consensus continues as to what constitutes an inclusive playground, how can UD contribute to the realization of public playgrounds that provide equity of play experience and social participation? Unless a clear definition of inclusive playgrounds is established, it is difficult to progress knowledge on how then to design playgrounds that are inclusive for all.

Comparison with literature and plausible explanations for results

Our principal results support an observation by Jane Bringolf [67], Chair of the Centre for Universal Design Australia, that a lack of understanding of the UD concept has allowed the terms "accessibility" and "disability" to inhabit the language of UD meaning that UD is bounded by such concepts, and thus, progress towards the design of environments that benefit everyone is hindered. Therefore, it is perhaps unsurprising that the primary focus on accessibility and disability issues in these peer reviewed journal articles neglects the needs of other diverse user groups of children who may have a comparable need for inclusion, albeit with a different range of needs [2]. For example, children from diverse cultural and family backgrounds and those from socioeconomically disadvantaged environments require play and social participation experiences where segregation and stigmatization are not perpetuated in public playgrounds. Thus, accessibility as a concept that facilitates physical participation, particularly for persons with disabilities, does not achieve the same outcome as UD, i.e., inclusion.

Nevertheless, Valerie Watchorn and colleagues [59] recently asserted that while much of the current discourse on UD and the built environment focuses on the person and the environment, much less attention has been directed towards what people do in built environments (e.g., play in public playgrounds). To address this gap, play researchers have begun to focus their efforts on how to design for play in public playgrounds, as it is through play that inclusion occurs. However, efforts to date have confirmed that designing for inclusion in public playgrounds is especially complex when considering the need to design for play [14,25,34]. Specifically, play researchers have identified that the current iteration of the seven principles of UD is not fit for purpose when considering the need to provide for play and support progressive levels of play challenge. For example, if a playground component needs to be simple and intuitive, according to UD principles, how can this support challenge which is a core feature of play value [14,34,42]. Thus, it is perhaps unsurprising that researchers have called for further interdisciplinary research that examines UD and considers how the principles of UD can be tailored to include play as a central concern as it relates to playgrounds [25,34]. Importantly, this has been hampered due to the inconstancies of approaches used across disciples and highlights the importance of this review to try and illuminate the issues arising, and rally researchers to strengthen insights and consensus.

Our suggestion to further enhance understanding of how UD can be utilized as a means to enhance play in public playground design is to learn from how UD has been tailored for learning approaches aiming to meet the needs of all students (Universal Design for Learning/UDL) [68], UD also needs to be tailored for play to meet the needs of all children (Universal Design for Play/UDP). While some efforts have been made by occupational scientists and therapists to tailor the principles of UD to include play as a central concern [34,41,42], further refinement through research and validation from a range of disciplines and investigations are required to enhance the clarity with which equity of play experience and social participation is defined, understood, and ultimately applied in strategic planning for public playgrounds.

Future research and implications

Our findings show an increasing interest in non-discriminatory planning and design concepts for public playground design, with 12 of the peer reviewed journal articles

identified published in the past 10 years. Nevertheless, while a range of disciplines and perspectives are evident in the body of knowledge presented, the discourse is notably from several developed countries, with more than half of the articles originating in European countries which raises the question of representation. Therefore, future research efforts need to address this knowledge gap, and carefully examine how UD, and related non-discriminatory planning and design concepts, are used in studies from the global south as well as the global north concerning designing for outdoor play, social participation, and inclusion in public playgrounds. Moreover, it is acknowledged that this review was completed in 2019; thus, the inclusion of newer research to capture the greater body of evidence would be of benefit in future research efforts.

Nonetheless, the findings of this research are timely as more and more efforts to disseminate the importance of UD for public playground design are materializing in various formats. Certainly, several international and national initiatives promote UD for public playground design. Internationally, the UN Convention on the Rights of Persons with Disabilities [29], General Comment No. 17 [2], and General Comment No. 2 [31], all endorse UD. In Europe, European Standard EN 17210:2021 Accessibility and usability of the built environment – Functional requirements [69] endorses UD for public playground design. It unequivocally states that "universally designed playgrounds, considering also the requirements of all children regardless of size or ability, provide more opportunities for all children to play, and for social integration" [69,p.255]. Also in Ireland, the context in which this study was undertaken, the new Community Participation Bill 2019 [70] specifically requires local authorities to build inclusive public playgrounds and promotes the concept of UD as a way of exceeding minimum accessibility standards. It articulates the need "apply the principles of universal design to the provision of playgrounds and play equipment to maximize the range of play opportunities available to all children" [70,p.3]. Furthermore, initiatives by the Centre for Excellence in Universal Design at the National Disability Authority in Ireland, such as funding projects that explore UD and public playground design [41], continue to ensure that there is a growing awareness of, and demand for, inclusive public playgrounds.

Conclusion

The recent discourse around UD and public playground design in peer reviewed journal articles indicate that the terms UD, inclusive design, accessibility, and usability are all being used arbitrarily and without regard for higher (goes beyond accessibility) or lower order (focuses solely on accessibility) concepts, which has potentially led to inconsistency and confusion. Still, the core concept of inclusion underpinned all 15 included peer reviewed journal articles, irrespective of what design concept was adopted; therefore, given that achieving inclusion is a defining feature of UD, it merits consideration for underpinning the design of public playgrounds.

Even so, the UD concept is widely endorsed, and an assumption is being made that UD translates into practice by its endorsement. However, there is a need for further development and research to acquire some common understanding of its relationship with inclusion in public playgrounds. It is evident from this review that UD, as it relates to public playgrounds, is in its early stages of maturity, given that only 15 peer reviewed journal articles met the inclusion criteria for this review. Therefore, what is missing is the nuances and intricacies of research that supports its position as a concept that achieves inclusion.

Moreover, the discourse reviewed here also reflects a dominance of accessibility factors over considerations of what people do in these spaces (i.e., play participation). If UD is intended as a means of going beyond designing for access, addressing accessibility factors alone provides a solution that falls short of the ambition to provide equity of play experience and social participation as envisioned by proponents of UD [49,50]. Therefore, to reach its stated goals, UD must be more inclusive of play as a central concern for public playground design.

Enlarging the discourse on UD to include play as a central concern, multi- and trans-disciplinary collaboration (within and outside the professional realm), and multicultural perspectives (from the global south as well as global north), will enhance the clarity with which UD is defined, understood, and ultimately applied in strategic planning for public playgrounds, from a UD for Play (UDP) perspective. Balancing this call for expansion, and echoing the recommendation set forth by Watchorn and

colleagues [59] is for the consistent use of “universal design” as a strategy to manage and promote the synthesis of a more diverse discourse accessible to all stakeholders.

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Figure captions

Figure 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [57] study selection flowchart

Alt Text: The PRISMA flow diagram maps out the number of records identified, included and excluded, and the reasons for exclusion

Figure 2: Number of publications in the review period (n = 15)

Alt text: The line graph plots the number of articles in each year of the review period

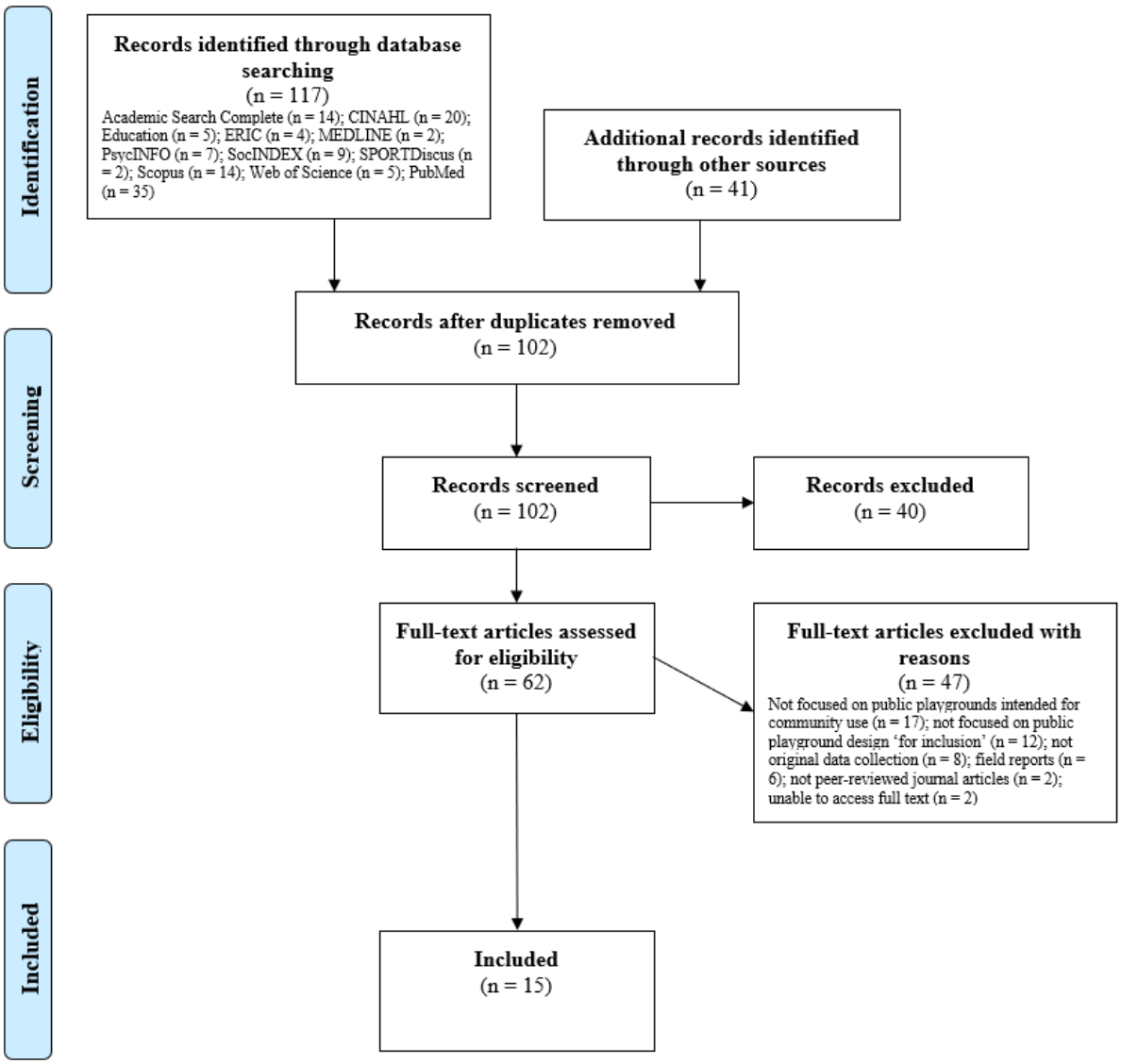


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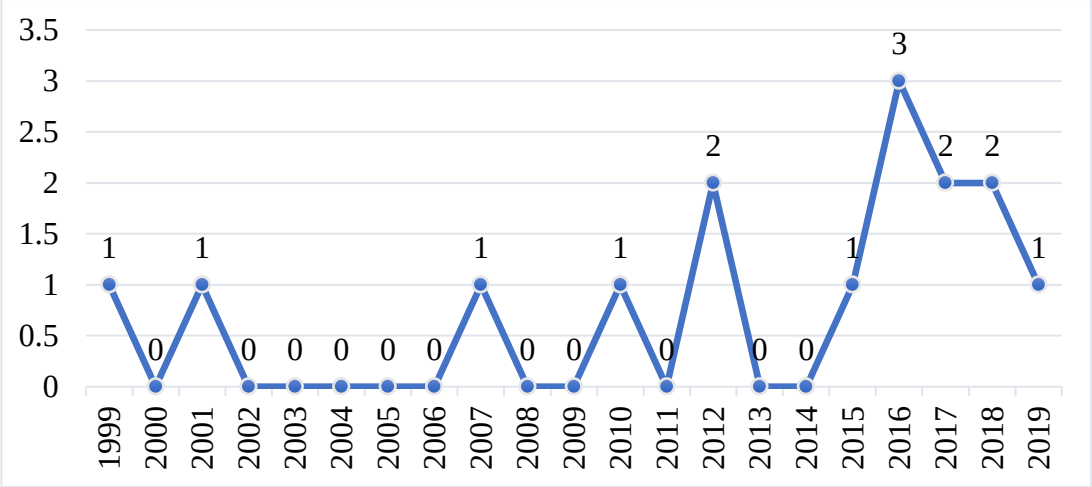


Figure 2: Number of publications in the review period (n = 15)

Alt text: The line graph plots the number of articles in each year of the review period

Tables

Table 1: Electronic databases, search terms, and criteria for inclusion

Electronic databases	Academic Search Complete, CINAHL, Education, ERIC, MEDLINE, PsycINFO, SocINDEX, SPORTDiscus, Scopus, Web of Science, PubMed
Search terms	***Playground terms*** (playground* OR "play space*" OR playspace* OR "outdoor play space*" OR "outdoor play environment*") ***Non-discriminatory planning and design terms*** (universal* design* OR "barrier free design*" OR "design* for all" OR "building* for everyone" OR "access* design" OR "inclus* design*" OR "architect* access*")
Criteria for inclusion	Written in English; Focused on public playgrounds intended for public use; Focused on non-discriminatory planning and design processes for built environments with the aim of promoting inclusion; Published in peer reviewed journals; Available in full-text.

Table 2: Geographical location of studies

Geographical location	**Reference(s)**
Europe	
Sweden	[21,28,43,44]
Ireland	[34,40]
Turkey	[18,61]
US	[46,47,48,60]
Canada	[24]
Australia	[27]
New Zealand	[62]

Table 3: Terms and definitions used in included peer reviewed articles

Reference and country	Year	Author discipline(s)	Terminology					Definition/ description of terminology used				
			Inclusion	Accessibility	Usability	Inclusive Design	UD	Inclusion	Accessibility	Usability	Inclusive Design	UD
Ayatac & Pola [61], Turkey	2016	Architecture; LA	•	•	•	•		ND	Inclusive spaces are all accessible; however, from time-to-time accessible spaces fail to possess the characteristics of an inclusive space.	ND	Inclusive design refers to the process in order to design products and environments that can be used by as many individuals as possible in as many occasions as possible [71].	

Fernelius & Christensen [48], US	2017	LA; Environmental Planning	•	•	•	•	•	Inclusion on the playground refers to creating an environment where all children have equal access and opportunity to engage in play as well as social interactions [65].	A playground that has as few physical barriers as possible, providing the opportunity for children of all abilities to physically approach the playground components, is deemed "accessible."	ND	An inclusive environment is designed to promote participation in the social aspects of play as well as physical access to the playground components.	ND
Lynch et al. [34], Ireland	2018	OT	•	•	•	•	•	ND	ND	ND	ND	UD is underpinned by seven principles [36] that aim to examine existing designs, guide the

												design process and act as a source of information on designing more usable products and environments.
Moore & Lynch [40], Ireland	2015	OT	•	•	•		•	ND	Accessibility can be defined as the encounter between the functional capacity of the individual and the demands of the physical environment [63]. Accessibility	Usability refers to the ability to access and use the environment on equal terms with others [63]. Usability does not focus on official standards and		ND

									also refers to compliance with official guidelines [63].	guidelines [63].		
Olsen & Dieser [60], US	2012	Health, Physical Education and Leisure	•	•	•	•	•	ND	ND	ND	ND	ND
Perry et al. [62], New Zealand	2018	Physiotherapy	•	•	•			ND	Accessibility is defined as, "the encounter between the person's or group's functional capacity and the design and demands of the physical environment [63].	Usability is defined as, "a measure of effectiveness, efficiency, and satisfaction" using a given facility or service [63].		

Prellwitz & Skär [21], Sweden	2007	OT; Nursing	•	•	•		•	ND	ND	The concept of usability implies that a person should be able to move around, be in and use the environment on equal terms with others [63,72,73].		UD supports the need for usability by designing products and environments that are usable by all people without specialized design.
Prellwitz & Skär [28], Sweden	2016	OT; Nursing		•			•		An accessible playground should offer an opportunity for play, the possibility to participate with other children, and a way for			The aim of UD is to promote equal rights and opportunities for all. UD also promotes the understandin g that people are different,

									parents and children to be involved in shaping their community.			and environments should afford different opportunities and solutions; the main goal is participation and inclusion [74,75].
Prellwitz & Tamm [43], Sweden	1999	OT; Psychology		•					ND			
Prellwitz et al. [44], Sweden	2001	OT; Psychology; Sociology		•					ND			
Ripat & Becker [24], Canada	2012	OT	•	•	•		•	ND	Accessible playgrounds have been suggested as a means of providing	Application of this concept suggests that children should be		UD is a specific design approach that promotes accessibility

									children with disabilities independence, easy access to play, and a safe, challenging, and fun environment by providing a play area in which typically developing children and children with disabilities can socialise, play, and learn together [76,77].	able not only to access a space but also to use the play space in the same way as other children [63].		for all individuals, regardless of ability [63].
Stanton-Chapman & Schmidt [46], US	2016	Early Childhood Education and Human	•	•			•	ND	ND			... Go beyond what is minimally required by

		Development; Owner and CEO of a playground installation company										law and focus instead on meeting the principles of UD where every child, regardless of ability or disability, is welcomed and benefits physically, developmentally, and socially from the playground environment.
Stanton-Chapman & Schmidt [47], US	2017	Early Childhood Education; Owner and CEO of a playground installation company		•		•	•		ND		ND	ND

Sterman et al. [27], Australia	2019	OT; Exercise Science	•	•				ND	ND			
Talay et al. [18], Turkey	2010	LA	•	•	•	•		ND	ND	ND	ND	

Abbreviations: ND: not defined. UD: universal design. LA: landscape architecture. OT: occupational therapy.

Chapter Five: Study III, Paper III

Moore, A., Boyle, B., & Lynch, H. (2022). Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for universal design. *Children's Geographies*. Advance online publication. https://doi.org/10.1080/14733285.2022.2073197

The first scoping review study (Study I, Paper I) found that no international peer reviewed studies reported on outcomes for the application of Universal Design (UD) to support outdoor play, social participation, and inclusion in public playgrounds. Consequently, this study aimed to provide a more complete review of all the available evidence, by reviewing grey literature guidelines. Specifically, to address the overall aim of this thesis, the aim of this scoping review study (**Study III, Paper III**) was to synthesise what is known from international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles, and design recommendations within these guidelines (**Study Aim 3**). Moreover, the review sought to determine the evidence for using UD and play value for public playground design, to bring together an improved understanding and knowledge base for those who plan, design, and/or provide public playgrounds.

With supervision and guidance from her supervisory team (Dr Bryan Boyle and Dr Helen Lynch), the research design, data collection, data extraction, and data analysis were conducted by the PhD candidate. The PhD candidate wrote this paper with supervisory support and mentorship from her supervisory team. This study was published online by the Children's Geographies Journal on 10 May 2022 following one round of revision in response to peer review feedback. Revisions focussed on providing further information on who guidelines were mainly oriented to (i.e., play of children), and determining what guidelines recommend co-design to ensure UD principles are upheld.

The study is presented here as it appears in print; therefore, as before, there is some overlap with the previous sections of this thesis. The figures and tables are presented at the end of the chapter.

Title

Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for Universal Design

Abstract

Universal Design (UD) is promoted internationally for the design of public playgrounds that support outdoor play, social participation, and inclusion. Despite this international recognition of UD, there is a lack of research evidence concerning the applicability of UD for playground design. Instead, municipalities need to rely on best practice guidelines to inform the design of public playgrounds for inclusion. Internationally, numerous grey literature guidelines have been produced for designing public playgrounds for inclusion, resulting in a lack of consensus on core principles for applying UD. Thus, this scoping review study aimed to synthesise findings from a review of international grey literature guidelines to strengthen the knowledge base for designing public playgrounds for inclusion. Three themes were identified that characterise core considerations for good design: (1) design approaches, (2) design principles and (3) design recommendations. Although UD is recognised as having potential to support the design of public playgrounds, inconsistent design approaches, principles, and recommendations, were communicated within these guideline documents. Still, the core concept of inclusion underpinned all guideline documents and a tailored application of UD dominated. Consequently, to fully realise the design of public playgrounds for inclusion, UD may need to be tailored for play; however, further research is required.

Keywords

play; playground; playground design; inclusive design; universal design

Introduction

Play is a universal and important process that is known to confer extensive benefits for children's health and wellbeing. This point is made in the UN Convention on the Rights of the Child (UN 1989), Article 31, the right to play, and further reinforced by play researchers (e.g. Ginsburg 2007; Moore and Lynch 2018). Public playgrounds, the focus of this paper, are outdoor play environments intended for community use, which

in most countries differentiates them from school playgrounds (Burke 2013). Public playgrounds are key geographies for families and children (Refshauge, Stigsdotter, and Cosco 2012) as they enable gathering, socialising, resting and importantly, participating in play (Lynch et al. 2020).

Yet, many children are not afforded equal opportunities to benefit from participating in a play in public playgrounds due to incongruencies between children's play needs and formal play environments typically designed, planned and managed by adults (Moore, Lynch, and Boyle 2020; Stafford 2017). Researchers have identified that public playgrounds can inadvertently perpetuate social and spatial marginalisation and exclusion, particularly for children with disabilities and their families, because of inadequate access, unsatisfactory play options, poor play value and insufficient opportunities for social interaction (e.g. Burke 2013; Jeanes and Magee 2012; Moore, Lynch, and Boyle 2020; Stafford 2017; Woolley 2012). Hence, there is a fundamental need to strengthen inclusive playground provision in the public realm.

Although much of the research on inclusive playground provision has taken place within schools (e.g. Bundy et al. 2008, 2011; Doak 2020; Kretzmann, Shih, and Kasari 2015; Sterman et al. 2020; Yantzi, Young, and Mckeever 2010), research is evolving on inclusive playground provision in the public realm. For example, researchers have explored user perspectives, investigated the perspectives of municipality representatives, reviewed policy documents, analysed guidelines, studied research evidence, developed tools to assess playground design, proposed frameworks for creating inclusive playgrounds, evaluated playground design, investigated the frequency and duration of children playing on a universally designed playground compared to children playing on an inclusive playground and designed inclusive playgrounds (Supplementary Table 1). No studies to date have evaluated outcomes of inclusive playgrounds from a Universal Design (UD) and play value perspective, as fundamental aspects of effective design (Brown et al. 2021; Moore, Lynch, and Boyle 2020; Parker and Al-Maiyah 2022).

Evidently, the design of public playgrounds has been implicated as a contributory factor in enabling inclusion (Brown et al. 2021; Fernelius and Christensen 2017; Lynch

et al. 2020; Moore and Lynch 2015; Moore, Lynch, and Boyle 2020). Furthermore, addressing play and participation through inclusive playground design has emerged as deserving of attention (Lynch et al. 2020; Moore and Lynch 2015; Moore, Boyle, and Lynch 2022; Moore, Lynch, and Boyle 2020, 2022). While Universal Design (UD) is commonly cited across the literature, there remains evidence of inconsistent understanding and application of the term (Moore, Boyle, and Lynch 2022). For example, Bianchin and Heylighen (2018) identified that 'UD', 'inclusive design' or 'design for all', are used internationally, but vary depending on the continent or region. The new European standard EN 17210:2021 Accessibility and usability of the built environment – Functional requirements (NSAI Standards 2021), elaborated upon these three terms and identified that further terms to the above such as 'accessible design', 'barrier-free design' and 'transgenerational design' are often used interchangeably. However, from this plethora of terminology, UD has emerged as a design approach that appears to be linked most closely with inclusion (Lynch et al. 2020; Moore and Lynch 2015; Moore, Boyle, and Lynch 2022; Moore, Lynch, and Boyle 2020, 2022).

The UN Convention on the Rights of Persons with Disabilities (UNCRPD) defines UD as 'the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design' (UN 2006, 4). Indeed, the UNCRPD (UN 2006) endorses UD as the most efficient way of ensuring that everyone can access and use public services and facilities. Furthermore, General Comment No. 17 (GC17) (CRC 2013), an authoritative statement on Article 31, identified UD as the way forward in public play provision. Still, Moore, Lynch, and Boyle (2020) recently identified a lack of evidence as yet concerning the applicability of UD for playground design. In addition, researchers found that despite having seven principles and eight goals to enable its application, UD is poorly understood as a concept, and requires further clarity and specificity as it pertains to playground design and inclusion in outdoor play (Moore, Boyle, and Lynch 2022; Moore, Lynch, and Boyle 2022).

Despite these limitations to UD specifically, there is an abundance of documentation to support 'inclusive design' in its general sense in the form of guidelines. Design guidelines play an important role in translating the principles of an approach such as

UD to guide the creation of inclusive solutions that meet the needs of children and families. They differ from published academic literature insofar as they are often more easily accessed by diverse stakeholders and aim to increase understanding of relevant design principles and their application. Numerous grey literature guidelines have been produced internationally for the design and provision of playgrounds for inclusion, and come from several sources, including non-governmental and not-for-profit organisations, industrial organisations (e.g. commercial manufacturers of playground equipment) and from implications of formal and informal research studies (Casey 2017; Lynch, Moore, and Prellwitz 2018, 2019). Despite their proliferation, researchers have found that few formal guidelines clearly articulate what a universally designed playground is or should be (Burke 2013; Fernelius and Christensen 2017; Moore and Lynch 2015). Also, inconsistent design principles, as well as solutions, are resulting in a lack of clarity (Moore, Lynch, and Boyle 2020); thus, it is difficult to establish good practice for the design and provision of playgrounds for inclusion, as few efforts have been made to synergise the information (Olsen 2015).

While some effort has been made in recent years to examine the evidence for best practice for designing playgrounds for inclusion (Brown et al. 2021; Fernelius and Christensen 2017; Moore and Lynch 2015; Moore, Lynch, and Boyle 2020), and to assemble information from guideline documents (Kim, Kim, and Maeng 2018; Lynch et al. 2019), to date, there has not yet been a systematic analysis of grey literature guideline documents to synthesise the design approaches, design principles and design recommendations for the design of universally designed public playgrounds, that enhance play value for inclusion and participation. Thus, to move beyond the exclusionary practices and determine what designing public playgrounds for inclusion is, or should be, the purpose of this study was to explore international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles and design recommendations within these guidelines. Moreover, the review aimed to determine the applicability of UD and play value, to bring together an improved understanding and knowledge base for those who plan, design and/or provide public playgrounds for inclusion.

Methods

This paper describes scoping review search methods that were developed and applied to conduct a review of grey literature pertinent to guidelines for the design of public playgrounds for inclusion. The most common definition of grey literature (the 'Luxembourg definition') defines it as 'that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers, i.e., where publishing is not the primary activity of the producing body' (Schöpfel et al. 2005). The Internet is often used as a platform for publishing grey literature by a wide range of organisations (Benzies et al. 2006) and tends to be widely accessible as subscriptions are not required, as may be the case with the peer reviewed scholarly literature (Godin et al. 2015).

Although scoping reviews typically comprise a review of published and grey literature on a given topic (Arksey and O'Malley 2005; Levac, Colquhoun, and O'Brien 2010; Peterson et al. 2017), for this study, a scoping review of grey literature exclusively was selected for four main reasons. First, a scoping review of published peer reviewed research literature on the design and provision of playgrounds for inclusion has already been conducted (Moore, Lynch, and Boyle 2020) and found no studies that reported on outcomes for the application of UD to enhance inclusion; second, the design and provision of public playgrounds for inclusion is therefore informed primarily by expert opinion and guidelines on good practice rather than being evidence-informed from formal peer reviewed studies; third, these guidelines warrant investigation, as inconsistent design approaches, principles and solutions are resulting in a lack of clarity on what a public playground design for inclusion is or should be; and fourth, guidelines for designing playgrounds for inclusion are typically released by government and non-government organisations and not published in academic journals. Thus, a review of grey literature would provide a more complete review of all available evidence (Mahood, Van Eerd, and Irvin 2014).

Consequently, a scoping review of grey literature was conducted using the five-stage approach originally described by Arksey and O'Malley (2005) and later refined by the

Joanna Briggs Institute (Peters et al. 2015) and other researchers (Levac, Colquhoun, and O'Brien 2010).

Stage 1: Identifying the research question(s)

This scoping review focused on answering the following research questions: (1) what are the characteristics of the grey literature guidelines for designing public playgrounds for inclusion (e.g. year published, source organisation, by whom they were developed, intended audience, goal/objectives of guideline)? and (2) what are the design approaches, design principles and design recommendations articulated within the guidelines for designing public playgrounds for inclusion?

Stage 2: Identifying relevant studies

To identify guideline documents for designing public playgrounds for inclusion, an electronic search of Google search engines was completed in November 2019 and updated in June 2020. Search terms included combinations of the following, in recognition of the various terms used to describe UD: (playground OR playspace OR 'play space') AND (guide* OR 'design guide*') AND (design* OR access* OR inclus* OR 'Universal Design'). The search generated 106 potentially eligible records.

Stage 3: Study selection

As the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommends using a study flow diagram to describe the screening and study selection process (Moher et al. 2009), this process was applied to the grey literature search methods (Figure 1). The title, year of publication, source organisation and web links of guideline documents identified were entered into an Excel sheet. For a guideline document to be included, strict inclusion criteria needed to be met (Table 1).

Of the 106 screened records, twenty-seven guideline documents that focused on designing public playgrounds for inclusion, met the inclusion criteria (Figure 1).

Stage 4: Charting the data

Following a full review of each included guideline document, data were extracted pertaining to guideline characteristics (source organisation, year published, by whom they were developed, intended audience, goal/objectives of guideline) and the design approaches, design principles and design recommendations within these guidelines. Only data that were relevant to the design of public playgrounds for inclusion were extracted (i.e. guidelines pertaining to specific play items were not extracted), consistent with the a priori objectives of the review.

Stage 5: Collating, summarising, and reporting the results

Using the data extraction chart, data were collated and summarised. Data analysis was conducted by the lead author of this scoping review and independently reviewed by the remaining authors. Data were analysed using a UD and play value framework.

Results

Evidence characteristics

Evidence characteristics were identified from the twenty-seven guideline documents that met the inclusion criteria, and data extracted pertaining to research question one. These are listed in Table 2 and, where referenced within this paper, highlighted with the relevant number.

Of these, twenty-four guideline documents were published between 2003 and 2020; a further three guideline documents did not list their date of publication (Table 2). Ten of the guideline documents originated from the United Kingdom (UK), six from the United States of America (USA), five from Australia, two from Canada and one each from Ireland, Denmark, China and India.

The guideline documents ranged from 7-pages to 156-pages, with the average number of pages being 51.6-pages, and originated from several sources, including non-profit organisations (n = 13), industrial organisations (n = 6), government organisations (n = 4), industrial-education cooperation (n = 2), government advisory organisation (n = 1) and from education (n = 1) (Table 2). All guideline documents provided guidance for designing public playgrounds for inclusion and the intended audiences

for the guideline documents were those that plan, design and/or provide public playgrounds (design professionals, councils/municipalities, and community groups).

Furthermore, as shown in Table 2, thirteen guideline documents referred explicitly to UD; however, only four of these utilised the seven principles of UD as their design principles (6, 11, 18 and 19). Thus, a degree of inconsistency and confusion was evident among the included guideline documents. Yet, the core concept of inclusion underpinned all twenty-seven guideline documents, irrespective of what design approach or design principles were adopted. Moreover, specific design recommendations relating to designing public playgrounds for inclusion were evident in all guideline documents. These will be discussed under the summary of main findings.

Summary of main findings

Three themes were identified from the data extracted and pertain to research question two. The first theme describes the design approaches that were used to describe designing for inclusion. Theme two addresses the design principles articulated to describe the concept of designing for inclusion. The third theme highlights the design recommendations for designing public playgrounds for inclusion.

Theme 1: Design approaches

Although all twenty-seven guideline documents provided guidance for designing public playgrounds for inclusion, UD was not always articulated as a design approach. As shown in Table 2, accessible design, inclusive design and UD were used to describe non-discriminatory planning and design processes.

Of the twenty-seven guideline documents, thirteen documents referred to UD as a design approach for inclusive public playground design (Table 2) and used UD interchangeably with accessible design and inclusive design; yet all thirteen documents defined what was meant by UD. Specifically, six documents drew upon definitions proposed by Ronald Mace (6, 18 and 22) and international Centres of Excellence in UD (9, 11 and 16). Moreover, two documents referred to rights-based documents when defining what was meant by UD; one guideline (8) drew upon GC17

(CRC 2013), while another guideline (19) referred to the UNCRPD (UN 2006). Furthermore, five documents did not necessarily cite their source, but defined UD differently as the design of: 'buildings, products, and environments that are usable and effective for everyone, not just people with disabilities, without the need for adaptation or specialised design' (13), 'products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design' (15), 'environments, services and products that are useable and accessible for people of any age and ability' (21), 'an approach to designing products, services, and environments to be usable by as many people as possible regardless of their ability' (24) and 'environments that are usable by more people, to the greatest extent possible' (25).

Overall, while differences were apparent across the definitions, when discussed in relation to play environments, the aims of UD, were articulated as follows: (i) moving beyond minimum accessibility, to ensure equal emphasis is placed on maximising varied play opportunities and supporting social integration (11, 16, 19, 22 and 24); (ii) creating a space where everyone is welcomed (9, 15 and 25); (iii) providing the same or equivalent experiences and activities (these may have to be provided in different ways for different people) (9 and 15); and (iv) designing a space with accessible, inclusive routeing and infrastructure and access to relevant ground- and elevated-level activities (19).

Yet, for the remaining fourteen guideline documents that did not refer explicitly to the UD design approach, ten guideline documents utilised inclusive design in combination with accessible design (Table 2). Also, two documents used inclusive design exclusively; like UD, inclusive design was defined as a space that 'offers and encourages play experiences for people of all abilities … ' (4), and 'beginning from a perspective of 'strengths,' … create [a] play space that is designed with everyone in mind and that challenges and supports children with a wide range of abilities' (14). In this way, inclusive design mirrored UD, in that it was about providing for all. Moreover, two further documents used accessible design exclusively, with a greater focus on children with disabilities; accessible design was defined as 'the criteria by which accessibility should be judged therefore is whether the disabled child was able

to play at the playground, rather than whether they were able to access a particular item of equipment, or complete a particular activity …' (1) and 'encouraging disabled and able-bodied children to play together' (26).

To summarise, most guideline documents (n = 23) utilised a combination of design approaches, or indeed, used the terms interchangeably for designing public playgrounds for inclusion. While UD was identified as a design approach with specific meanings and aims, when used, it was always used in combination with other approaches. It is not clear why this was the case; however, as established in the literature review, UD, inclusive design, and accessible design are often used interchangeably. Nevertheless, given that UD was defined as a specific design approach with specific aims, inclusive design held similar meanings to UD, whereas accessible design differed because it was about designing for disability. In any case, it could be argued that while single design approaches were adopted in some instances, a combination of approaches appears to be the most favoured approach for designing public playgrounds for inclusion among the included guideline documents. Indeed, apart from two documents focusing on accessible design, there was an overall recognition among the guideline documents of the need to move beyond minimum accessibility, and thus, a combination of approaches was adopted in most instances.

Theme 2: Design principles

The principles and/or goals of UD were not always articulated as design principles for designing public playgrounds for inclusion among the twenty-seven guideline documents. However, given the establishment of UD as the design approach recommended by the GC17 (CRC 2013) and the UNCRPD (UN 2006), and the evidence of it being the most advanced in terms of principles and goals, the seven principles of UD were used as an analytical tool to map the design principles. As shown in Table 2, the number of design principles, listed in the guideline documents, ranged from nil to ten principles, with the average number being 4.4 principles.

As noted earlier, thirteen guideline documents referred explicitly to UD. However, only seven guideline documents referred to the commonly accepted seven principles of UD; four of these guideline documents utilised the seven principles of UD as their

design principles (6, 11, 18 and 19), while three guideline documents tailored the principles of UD for playgrounds (22, 24 and 25) (Table 2). For the remaining six guideline documents that referred explicitly to UD, one document identified seven principles (9), one guideline document listed three principles (16), one guideline document named three essential factors (21) and three documents did not list design principles (8, 13 and 15) (Table 2).

For the remaining fourteen guideline documents that did not refer explicitly to UD but instead referred to accessible design and/or inclusive design, numerous design principles were apparent. Specifically, three guideline documents listed ten design principles (3, 5 and 26), one guideline document identified seven design principles (7), two guideline documents listed six design principles (4, 10), one guideline document utilised five design principles (20), one guideline document named three design principles (23) and six guideline documents that referred to accessible design and/or inclusive design did not list any design principles (1, 2, 12, 14, 17 and 27) (Table 2).

To summarise, a combined eighteen of the twenty-seven guideline documents articulated design principles for designing public playgrounds for inclusion. Thirteen guideline documents referred explicitly to UD; however, only seven guideline documents referred to the commonly accepted UD principles (Connell et al. 1997). Still, only four of these guideline documents utilised the seven principles of UD as their design principles (6, 11, 18 and 19), while the remaining three documents employed them in different ways to make them more specific to playgrounds (22, 24 and 25). A further eleven guideline documents articulated their own design principles suggesting that UD principles either require further tailoring to make them more specific to playgrounds or are not deemed applicable. Yet, as evident above, the principles vary significantly across the guideline documents, which further adds to the confusion when attempting to determine what an inclusive playground is or should be.

Still, play, play value and children's participation in the physical and social environments for play were significant. Moreover, when the seven principles of UD were applied as an analytical tool to map the design principles that did not use the seven UD principles, but instead either tailored the seven UD principles, or articulated

their own design principles, the three most common UD principles evident were equitable use, flexibility in use and tolerance for error. Moreover, regardless of what design principles were adopted, twenty-two guideline documents endorsed the need for co-design when designing public playgrounds for inclusion. Co-design varied from engaging and involving children (1, 2 and 5), adults (e.g. parents) (14 and 19), children and adults (3, 4, 6, 7, 13 and 20), children, adults and the community (e.g. disability organisations; residents) (9, 11, 15, 16, 18, 21 and 22), as well as the community (12, 23, 26 and 27).

Theme 3: Design recommendations

Among the twenty-seven guideline documents, numerous design recommendations for designing public playgrounds (play spaces) for inclusion were apparent. Design recommendations were categorised into recommendations as they pertained to: (1) play value, (2) location, layout and accessibility and (3) support features. While the length of the paper precludes a full discussion of each of the design recommendations (e.g. the design process and including users), attention will be drawn to the main messages.

Play value

Play value is used to describe the value of an environment, object, or piece of equipment for play. For play value, design recommendations pertained to the provision of inclusive play spaces and play items that were inclusive of persons of all backgrounds, ages, and abilities to participate in varied types of play. Play value recommendations were categorised into nine issues, outlined below.

For **engaging people of all ages and abilities**, twenty-five documents provided recommendations (Table 2). Indeed, the need to provide meaningful opportunities for inclusive, intergenerational play was recommended. Specific recommendations included the need to: provide play equipment to allow family groups to play together; select play activities so that people of all ages can engage in play; avoid segregating individuals by ability by ensuring that the most fun activities are also the most accessible; and include adult-centred play spaces where seniors can socialise through shared activities (e.g. exercise equipment, etc.). While there was acknowledgement of

the need to provide meaningful opportunities for inclusive, intergenerational play, twenty documents were primarily oriented towards play for children (1, 2, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25 26 and 27).

For **selecting play space equipment**, twenty-four documents provided recommendations (Table 2). Specifically, there was recognition among the documents that having a one hundred per cent accessible play space is not possible; however, the overall aim is to ensure that all children have access to the social experience of play and equality of play experience. Even so, specific recommendations included the need to: select equipment that complies with country specific standards; ensure some provision for people with differing abilities (e.g. equipment with UD features); select 'non-prescriptive' equipment that can be used flexibly by children of different ages and interests; use colour carefully to avoid over stimulation or confusion; and maintain equipment overtime to reduce the inherent risks.

For **accessing play space equipment**, twenty documents provided recommendations (Table 2). Recommendations included the need to: ensure access to high-interest, fun areas of the play space; ensure clear ground space so that a child who is using a wheelchair can access the play equipment and features by sitting at/under them; place equipment so that it can be reached by children at different sitting and standing heights and abilities; and provide play equipment that accommodates variations in gross and fine motor control.

For **grouping play space equipment**, fourteen documents provided recommendations (Table 2). Specifically, there was recognition that good play spaces avoid segregating children based on age or ability and are laid out so that equipment and features can be used by a wide range of children and allow for different patterns of usage. Specific recommendations included the need to: consider play equipment fall zones, movement zones, areas to 'wait your turn' and space for multiple users when grouping equipment; locate similar types of equipment in the same area; and incorporate equipment or features with graduated levels of challenge, that is, options for children to try different challenge levels.

For **incorporating challenge and risk**, twenty-one documents provided recommendations, particularly as it related to play challenge in the playground (Table 2). Recommendations included the need to: include a range of stimulating and imaginative activities in the play space with several overlapping scales of difficulty; and balance risk and benefits in a strategic way, using a policy framework (detailing the approach to risk and safety), to help resist unjustified negligence claims.

For play types then, recommendations were largely categorised into affordances for four play types: physical, sensory, social and cognitive/dramatic/imaginative play. For **physical play**, twenty-four documents provided recommendations (Table 2). Physical play affordances included features, equipment or spaces that afforded the following actions: spinning; sliding; rocking; swinging; climbing; crawling and strengthening; balancing; jumping and bouncing; and walking, running, and rolling. Moreover, tunnels and cableways/ziplines were recommended. Also, the provision of accessible play items that provide for varied play preferences and play styles, as well as graduated challenge was recommended.

For **sensory play**, twenty-three documents provided recommendations (Table 2). Sensory play affordances included features, equipment or spaces that afforded the following sensory experiences: tactile/touch (smooth, soft, hard, rough, grainy, and uneven); auditory/sound; visual experiences/sight; as well as smell and taste. Also, natural elements (water, earth, fire and wind), natural features (e.g. trees, willow structures and plants that create loose parts), planting (non-thorny and non-toxic) and cosy/quiet areas, were recommended. Moreover, the need to carefully consider the location of sensory stimuli to avoid creating a chaotic sensory environment of haphazard stimuli as well as ensure that sensory stimuli were accessible to all and afford play value was recommended.

Also, for **social play**, twenty-five documents provided recommendations to foster social play opportunities (Table 2). These included the need to include features, equipment or spaces that: encourage cooperative play (e.g. equipment that requires reciprocal interaction to operate it); and encourage interaction with others while playing (e.g. spaces to congregate).

Finally, for **cognitive/dramatic/imaginative play**, twenty-three documents provided recommendations to foster cognitive/dramatic/imaginative play opportunities (Table 2). These included the need to: include a mixture of dramatic and realistic play equipment and features (e.g. stage/platform, playhouse and play items that resemble other items); utilise play spaces under/on the play structure; incorporate loose parts (e.g. construction materials); and ensure that cognitive/dramatic/imaginative play opportunities are accessible.

Location, layout, and accessibility

For location, layout and accessibility, design recommendations primarily pertained to maximising accessibility and inclusion in the built environment and were categorised into nine main issues: location; parking and other ways to arrive; entryway and orientation; surfacing; pathways; wayfinding; orientation in and around the space; perimeter boundary; and supervision and surveillance. While the length of the paper precludes a full discussion, the design recommendations for location, layout and accessibility as they relate to each of these nine issues can be found in Supplementary Materials.

Support features

Support features largely pertained to supportive infrastructure and amenities to maximise inclusion in the built environment within and surrounding the play space. For support features, design recommendations were categorised into twelve main issues: seating; tables/picnic tables; spaces to gather and socialise; shade and sheltered areas; toilets/changing facilities; litter bins; drinking fountains; lighting; storage facilities; service/assistance animals; signage; web page/social media. While the length of the paper precludes a full discussion, the design recommendations for support features as they relate to each of these twelve issues can be found in Supplementary Materials.

Discussion

The purpose of this study was to explore international grey literature guidelines for designing public playgrounds for inclusion. Moreover, this review aimed to determine the applicability of UD and play value in designing public playgrounds for inclusion.

While some effort has been made in recent years to examine the evidence for best practice for designing public playgrounds for inclusion (Brown et al. 2021; Fernelius and Christensen 2017; Moore and Lynch 2015; Moore, Lynch, and Boyle 2020), and to synergise information from guideline documents (Kim, Kim, and Maeng 2018; Lynch et al. 2019), for the first time, this systematic analysis of grey literature guideline documents provides a broad understanding of how design approaches, design principles and design recommendations for designing public playgrounds for inclusion are conceptualised and discussed in guidance documents in many international contexts. Indeed, findings from this review show that grey literature guideline documents are an important source of knowledge for designing for inclusion, and in the absence of evidence for implementing UD, potentially provide a vision for inclusive playground design (Moore, Lynch, and Boyle 2022).

Despite differences, the core concept of inclusion underpinned all twenty-seven guideline documents in this review. Findings from this review highlighted the importance of autonomy of inclusion, which deconstructs assumptions on 'providing for all'. Certainly, there was acknowledgement that no one size fits all and public playground users are not a homogenous group; inclusion, however requires that provision be made for different ages, abilities, play preferences and comfort preferences, for example. Nevertheless, while there was acknowledgement of the need to provide meaningful opportunities for inclusive, intergenerational play among most guideline documents, they were primarily oriented towards the play of children. Nevertheless, given that achieving inclusion by providing for different abilities is a defining feature of UD, we must carefully consider how it can underpin the design of public playgrounds, echoing findings from a recent review of the academic literature (Moore, Lynch, and Boyle 2020). This would contribute to discussions on changing social expectations of the concept of who can 'play' and where, given the value of public playgrounds in terms of providing shared community spaces.

In this review of guideline documents, multiple design approaches and numerous design principles were evident, suggesting an inconsistency and confusion between approaches, principles and application. Indeed, the analysis revealed that design approaches were often named without context/source/citation. While UD and

inclusive design were the most common approaches articulated among the reviewed guideline documents, two used accessible design exclusively as a design approach. Despite the assertion that accessible design is synonymous with UD, it has recently been asserted that accessibility factors alone are inadequate for addressing play participation in inclusive playgrounds (Moore, Lynch, and Boyle 2020, 2022; Moore, Boyle, and Lynch 2022). As noted in the findings, design recommendations identified the need to consider accessibility, play value, progressive levels of challenge and adopt a balanced approach to risk. These extend beyond accessibility and aim toward the provision of public playgrounds that offer inclusive and varied play experiences and facilities. Therefore, conflating accessible design with UD risks overlooking key inclusion measures such as play value, and a collective approach to its eventual use. Indeed, the concept of play value is now identified as central to public playground design among international researchers (e.g. Parker and Al-Maiyah 2022; Woolley and Lowe 2013).

It has been concluded elsewhere that the application of UD is problematic when considering the need to design for play (Casey 2017; Lynch, Moore, and Prellwitz 2018; Moore, Lynch, and Boyle 2020). Despite the challenges, UD is endorsed by GC17 (CRC 2013) and the UNCRPD (UN 2006), and is also promoted by international researchers for providing conceptual guidance for designing playgrounds that are inclusive (Burke 2013; Casey 2017; Moore, Lynch, and Boyle 2020, 2022; Moore, Boyle, and Lynch 2022; Prellwitz and Skär 2007, 2016; Stanton-Chapman et al. 2020; Woolley 2012). Consequently, to fully realise the design of public playgrounds for inclusion, UD may need to be tailored for play (UD for play [UDP]) (Moore, Boyle, and Lynch 2022) in the same way it has been tailored to ensure equity of teaching and learning in inclusive education (UD for Instruction/UDI) (Burgstahler 2009). A similar approach could be adopted to consolidate the importance and future application of UD for Play (UDP) – this proposal suggests that UD could/should be integrated with play value in such a way that it can be applied to the overall design of inclusive public playgrounds as well as of specific playground components, terrain and facilities.

Methodological considerations

Despite efforts to conduct this scoping review of grey literature systematically and rigorously, there are some limitations. To maintain the focus of this scoping review, several criteria were put in place that excluded potentially relevant studies. Specifically, the use of Google search engines as the primary source for locating grey literature, available free of charge, may have omitted a greater diversity of evidence. Also, guidelines selected for inclusion focus on public playgrounds that are intended for community use, and do not specifically consider school playgrounds; this may have overlooked potentially relevant evidence, as school playgrounds are becoming more available for public use, outside of school hours, in international contexts. Although these guidelines originated in four continents (North America, Australasia, Europe and Asia), no specific cultural or spiritual differences were identified, which needs further exploration in future studies. Finally, this scoping review of grey literature was limited to guideline documents published in the English language; therefore, evidence published in other languages was omitted.

Importantly, this scoping review excluded guideline documents for specific contexts that do not translate to other contexts (e.g. each fit within specific national country-specific contexts in relation to standards and laws). While the included guideline documents applied to designing public playgrounds for inclusion in general, it must be acknowledged that country specific standards/laws are mandatory, and therefore, guideline documents need to be used in combination with the relevant country specific standards/laws to avoid potentially dangerous/illegal practices. Nevertheless, if country specific standards/laws do not mention UD then there might be a perception that there is no obligation to attempt or consider UD for public playground design. However, given the establishment of UD as the design approach recommended by the GC17 (CRC 2013) and the UNCRPD (UN 2006), this scoping review revealed that guideline documents play an important role in offering guidance for designing public playgrounds for inclusion. Thus, the overlap between what is mandatory (country specific standards/laws) and what is optional (guidelines) is worth exploring in future research.

Conclusion

The review of grey literature evidence reveals some important findings that would not have been apparent without a comprehensive analysis of grey literature. The synthesis of evidence from this review brings together an improved understanding for those that plan, design and provide public playgrounds for inclusion. Although UD is recognised to have the potential to support the design of public playgrounds, inconsistent design approaches, principles and recommendations, were communicated among the included guideline documents. Still, the core concept of inclusion underpinned all guideline documents, and a tailored application of UD dominated. Consequently, to fully realise the design of public playgrounds for inclusion, UD may need to be tailored for play (UD for play [UDP]) (Moore, Boyle, and Lynch 2022); however, further research is required.

Therefore, future research needs to establish best practice guideline documents for designing public playgrounds for inclusion as well as explore the perspectives of 'users' and 'creators' (i.e. 'end users' and those with technical expertise) of public playgrounds, to overcome the inequalities faced by diverse public playground patrons and strengthen socio-spatial inclusion. While involving users is not yet common practice in built environment design (Heylighen, Van der Linden, and Van Steenwinkel 2017), this review highlighted that the success of public playground design is dependent on honest and respectful co-design and co-creation with creators, from project inception to outcome, otherwise, design can/does still occur with limited contextual understanding of the lived experience.

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Tables

Table 1: Inclusion and exclusion criteria

Inclusion criteria	**Exclusion criteria**
Freely accessible guideline documents for designing public playgrounds for inclusion.	Inaccessible guideline documents (e.g., at a cost) for designing public playgrounds for inclusion.
Guideline documents that focus on designing public playgrounds for inclusion.	Documents that did not focus on designing public playgrounds for inclusion (e.g., focused on nature exclusively).
Guideline documents that translate to other contexts (e.g., general guidance).	Guideline documents for specific contexts that do not translate to other contexts (e.g., compliance with country specific standards/ laws).
Available in English language.	Not available in English language.

Table 2: Design approaches, principles, and recommendations

No.	Author(s), Publication year and location	Title	Main agent	Page count	Design approach(es)			Design principles	Play value design recommendations								
					Accessible design	*Inclusive design*	*UD*		*Engaging people of all ages and abilities*	*Selecting play space equipment*	*Accessing play space equipment*	*Grouping play space equipment*	*Incorporating risk and challenge*	*Physical play*	*Sensory play*	*Social play*	*Cognitive/ Dramatic/ Imaginative play*
1	Alison and Wheway 2004 UK	Can play, will play: Disabled children and access to outdoor playgrounds	Non-profit organisation	45	●				●	●	●			●		●	
2	DESSA 2007 Ireland	Play for all: Providing play		44	●	●			●	●	●	●	●	●	●	●	●

		facilities for disabled children																
3	Shackell et al. 2008 UK	Design for play: A guide to creating successful play spaces		156	●	●		*10 principles	●	●	●	●	●	●	●	●	●
4	Touched by Olivia 2012 Australia	The principles for inclusive play		7		●		(1) Everyone can play (2) A connection to community (3) Access to nature (4) Total experience (5) Play independence: I can do it myself (6) Friendship and social participation	●					●	●	●	●

5	Play Wales 2016 UK	Developing and managing play spaces: A community toolkit		37	●	●		*10 principles	●	●				●	●	●	●
6	Yuen 2016 China	Inclusive play space guide: Championing better and more inclusive spaces in Hong Kong		132	●	●	●	** 7 UD principles	●	●	●	●	●	●	●	●	●
7	Pooja Hiranandani, Krishnamoorthy, and Gopal 2016 India	Breaking barriers through play: Policy guidelines and a technical manual for making		117	●	●		(1) Reach (2) Dedicated spaces for play (3) Inclusion and accessibility (4) Age-appropriateness	●	●	●		●	●	●	●	●

		play spaces inclusive						(5) Free (6) Protection and safety (7) Community participation										
8	Play Wales and Alison John and Associates 2017 UK	Creating accessible play spaces: A toolkit		47	●	●	●			●	●		●	●	●	●	●
9	Casey and Harbottle 2018 UK	Free to play: A guide to creating accessible and inclusive public play spaces		60	●	●	●	(1) Inclusive (2) Responsive (3) Flexible (4) Convenient (5) Accommodating for all people (6) Welcoming (7) Realistic	●	●	●			●	●	●	●
10	Inclusive Play, KIDS, and Wagenfeld 2019 UK	PiPA: Plan inclusive Play Areas		N/A	●	●		(1) Plan to go (2) Plan to access (3) Plan to play (4) Plan to rest and recharge	●		●		●	●	●	●	●

								(5) Plan to engage (6) Plan to expand										
11	Rick Hansen Foundation 2019 Canada	A guide to creating accessible play spaces		92	●	●	●	** 7 UD principles	●	●	●	●	●	●	●	●	●
12	Christopher and Dana Reeve Foundation n.d. USA	Toolkit for building an inclusive community playground		20	●	●			●					●	●	●	●
13	Rick Hansen Foundation n.d. Canada	Let's play toolkit: Creating inclusive play spaces for children of all abilities		40	●	●	●		●	●	●		●	●	●	●	●
14	Luce 2015 Australia	Inclusive design manual: A guide to	Industrial organisations	21		●			●	●			●	●		●	

		creating play spaces which welcome children of all abilities																
15	HAGS 2018 UK	Inclusive play design guide		56	●	●	●		●	●	●	●	●	●	●	●	●	
16	Landscape Structures 2018 USA	Inclusive playspace design: Planning guide		20	●	●	●			●			●	●	●	●	●	
17	HAGS 2019 UK	Guide to creating inclusive playgrounds		24	●	●			●	●			●					
18	Playworld 2019 USA	Inclusive play design guide		45	●	●	●	** 7 UD principles	●	●	●	●	●	●	●	●	●	
19	Kompan Play Institute 2020 Denmark	Play for all: Universal design for		36	●	●	●	** 7 UD principles	●	●	●	●	●	●	●	●	●	

		inclusive playgrounds																
20	Dunn, Moore, and Murray 2003 UK	Developing accessible play space: A good practice guide	Government organisations	40	●	●		(1) What to put in the play space (2) Using the natural environment (3) Social experience of play (4) Safety (5) Designing for families	●	●	●	●	●		●	●	●
21	State of Victoria 2007 Australia	The good play space guide: "I can play too"		80	●	●	●	(1) Play value (2) Accessibility/ inclusion (3) Safety	●	●	●		●	●	●	●	●
22	NSW Government 2019 Australia	Everyone can play: A guideline to create inclusive playspaces		78	●	●	●	(1) Find (2) Fit (3) Choose (4) Join in (5) Thrive (6) Belong	●	●	●	●	●	●	●	●	●

23	Government of South Australia n.d. Australia	Inclusive play: Guidelines for accessible playspaces		40	●	●		(1) Connect with place (2) Connect with each other (3) Connect with self	●	●	●	●	●	●	●	●	●
24	PlayCore, GameTime, and Utah State University 2008 USA	EveryBODY plays!	Industrial-Education cooperation	19	●	●	●	(1) Be fair (2) Be included (3) Be smart (4) Be independent (5) Be safe (6) Be active (7) Be comfortable	●	●	●	●	●	●	●	●	●
25	PlayCore and Utah State University 2016 USA	Me2: 7 principles of inclusive playground design		57	●	●	●	(1) Be fair (2) Be included (3) Be smart (4) Be independent (5) Be safe (6) Be active (7) Be comfortable	●	●	●	●	●	●	●	●	●

26	CABE Space 2008 UK	Public space lessons: Designing and planning for play	Government advisory organisation	8				(1) Designed to enhance its setting (2) Located in the best possible place (3) Close to nature (4) Designed so that children can play in different ways (5) Geared towards encouraging disabled and able-bodied children to play together (6) Loved by the community (7) Where children of all ages play together									
					•				•	•		•						

								(8) Designed to enable children to stretch and challenge themselves in every way (9) Maintained for play value and environmental sustainability (10) Flexible and able to evolve as the children grow									
27	Liedtke 2016 USA	Creating inclusive play and community spaces: An out-of-the-box approach to	Education	52	•	•			•	•	•	•	•	•	•	•	•	

		social and emotional inclusion															

Notes.

*10 principles (Are bespoke; Are well located; Make use of natural elements; Provide a wide range of play experiences; Are accessible to both disabled and non-disabled children; Meet community needs; Allow children of different ages to play together; Build in opportunities to experience risk and challenge; Are sustainable and appropriately maintained; Allow for change and evolution)

** 7 UD principles (Equitable use; Flexibility in use; Simple and intuitive use; Perceptible information; Tolerance for use error; Low physical effort; Size and space for approach and use

Figures

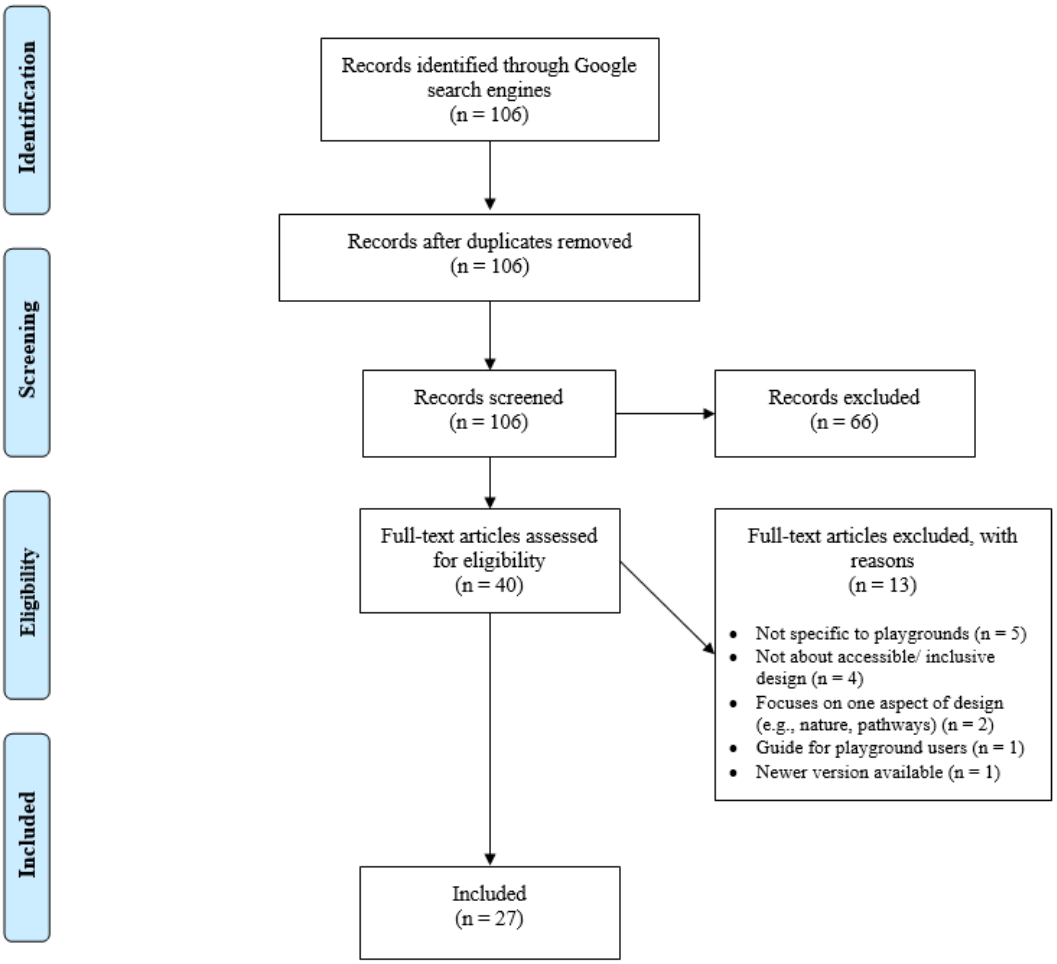


Figure 1: PRISMA diagram of study selection process (Moher et al. 2009)

Supplementary Material

Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for Universal Design

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Supplementary Material

Findings: Theme 3

Location, layout, and accessibility

For location, layout, and accessibility, design recommendations primarily pertained to maximising accessibility and inclusion in the built environment and were categorised into nine main issues, presented below.

For **location**, nineteen documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) orientate and position the play space to utilise the site's unique features (e.g., views, existing vegetation); (b) connect the play space with transport networks (e.g., bus, train, light rail); (c) include appropriate arrival facilities (e.g., pedestrian and cycle routes, accessible parking); (d) connect street footpaths and the play space entry with safe road crossing points; and (e) include an accessible path (without stair-only access) from/to the street, carpark and supporting facilities.

For **parking and other ways to arrive**, twenty-one documents provided recommendations (Supplementary Table 2). For parking, these included the need to: (a) ensure car parks comply with country specific standards; (b) include convenient and designated accessible parking close to playground; and (c) provide an accessible path of travel from the car park to the playground. For other ways to arrive, recommendations included the ned to: (a) locate the playground so that it connects with transport networks (e.g., bus, train, light rail, path/cycle networks); (b) consider including a bus parking/drop-off zone for larger playgrounds; and (c) include appropriate arrival facilities (e.g., pedestrian and cycle routes, bicycle racks).

For **entryway and orientation**, seventeen documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) consider a formal entry point that is accessible and linked by an orientation path to help people connect between all points of entry and exit; (b) incorporate a pause point to observe the layout, become familiar with the space, and decide where to go first; (c) incorporate signage or a map to assist with navigation and decision-making; and (d)

add a "parking lot" immediately inside the entry way to park prams, buggies, wheelchairs, and other adaptive equipment.

For **surfacing**, twenty-three documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) utilise surfacing that complies with country specific standards; (b) provide a variety of play surfacing to provide a contrast between activity, fall, and circulation zones; (c) consider the intensity of use, climate, ground profile and ground soil/ conditions when selecting surfacing; (d) incorporate inclusive play surfaces (e.g., wet pour, asphalt, concrete, poured-in-place).

For **pathways**, twenty-four documents provided recommendations (Supplementary Table 2). Recommendations included the need to provide pathways that are: (a) accessible (e.g., free from steep slopes); (b) free from barriers (e.g., kerbing); (c) level; (d) composed of a firm, predictable surface; and (e) wide enough so that two people using a wheelchair or mobility device to pass each other with ease.

For **wayfinding**, twelve documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) develop a wayfinding system to help people easily navigate the play space (e.g., consistent multi-sensory signals and cues; a hierarchy of pathways); (b) provide accessibility features to assist with wayfinding (e.g., tactile map; colour contrast); and (c) provide a clear logical layout from entry to exit with play zones arranged adjacent to a main orientation path.

For **orientation in and around the space**, fifteen documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) link the play space to surrounding elements (e.g., pathways); (b) provide a connection between the play space and the surrounding landscape to broaden the play experience; (c) ensure that there is a “flow of play” from one item to the next; (d) ensure that there is enough space between equipment for all users to navigate and manoeuvre; and (e) divide the larger play space into areas that allow for delineation of activities (e.g., separate vigorous play from quiet play zones).

For **perimeter boundary**, eighteen documents provided recommendations (Supplementary Table 2). Specifically, it was recommended to consider the purpose

of the perimeter or boundary for the specific location before making decisions about what is required, i.e., complete / partial / no boundary. If it is decided that a perimeter boundary is required, recommendations included the need to: (a) consider what perimeter boundaries can add in terms of aesthetics and play value; (b) provide a fence or natural boundary (e.g., landform; planting); (c) avoid horizontal components, entrapment spaces, sharp components, cables or wire fencing; and (d) choose gates that are difficult to open by a child but can be operated by an adult using a wheelchair or mobility device.

Finally, for **supervision and surveillance**, sixteen documents provided recommendations (Supplementary Table 2). Specifically, to minimise the risk of children leaving the playground unsupervised, recommendations included the need to: (a) install a perimeter boundary (per above); and (b) allow for adult sight lines so that caregivers can safely supervise and facilitate children's participation in play when needed. For adult sight lines, the following was recommended: (i) ensure clear line of sight from the entryway to the play space and parking lot; (ii) maximize the use of see-through equipment; and (iii) offer shaded, accessible seating and supervision areas throughout the play environment with a clear line of sight for seated or standing users.

Support features

Support features largely pertained to supportive infrastructure and amenities to maximise inclusion in the built environment within and surrounding the play space. For support features, design recommendations were categorised into twelve main issues, discussed below.

For **seating,** twenty-four documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) provide seating at regular intervals on a universal route; (b) orient seating for the best vantage points for caregivers to supervise children during play; (c) set seating back far enough to allow for enough clearance space adjacent to the seat to park a pram, wheelchair, or mobility device without blocking the circulation space or path; (d) offer accessible seating options (e.g., some seating with armrests, and some without, to allow someone in a wheelchair to transfer to them); and (e) locate seating so the user is comfortable in all seasons (e.g., shade).

For **tables/ picnic tables**, sixteen documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) locate tables on a universal route; (b) orient tables for the best vantage points for caregivers to supervise children during play; (c) locate tables to promote multigenerational socialization; (d) provide tables that allow for multipurpose use (e.g., chessboard painted on tabletop); (e) include square, round, or hexagonal shaped tables to suit wheelchair users so everyone can sit together (enable a person to roll up to the table and put their legs underneath without getting hit by the tabletop; allow space for more than one wheelchair); and (f) locate tables so the user is comfortable in all seasons.

For **spaces to gather and socialise**, twenty-six documents provided recommendations (Supplementary Table 2). Specifically, inclusive play spaces were recognised to provide good opportunities for adults to relax and socialise with others. In particular, the use of seating, play equipment, play features (e.g., boulders) or other landscaping features were recommended to create gathering spaces where different age groups might choose to congregate, wait, sit, and/or supervise. Moreover, it was recommended to provide shade over gathering places to extend use of playgrounds in hot weather and provide shelter in cold or windy weather.

For **shade and sheltered areas**, twenty-one documents provided recommendations (Supplementary Table 2). Specifically, supporting diverse comfort characteristics was recommended via planning for a range of environmental conditions with a mix of sunlight, shade, and wind protection. Moreover, ensuring that the play space has adequate shade over key play areas and seating to protect from strong sunlight and exposure to inclement weather was recommended via canopies, sails shades, trees, and solid shade structures (e.g., pergola).

For **toilets/ changing facilities**, twenty-one documents provided recommendations (Supplementary Table 2). Specifically, the provision of accessible toilets was regarded as crucial to the development of inclusive play space. Insofar as possible, it was recommended to include toilets with: (a) an accessible pathway and wheelchair access; (b) tactile signage and Braille; (c) doors that are easy to open and lock; (e) an adult-sized change bench in at least one unisex cubicle; (f) baby changing facilities; and (g)

regular maintenance. If it is not possible to install toilets and changing facilities, it was recommended to locate the play space near accessible facilities.

For **litter bins**, seven documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) locate bins on accessible routes; (b) not locate bins in clear spaces next to benches (those spaces may be needed for people using wheelchairs); (c) not locate bins within eating areas; (d) include bins that can be operated with one hand (e.g., open tops, push doors); and (e) ensure bins are properly and regularly disposed.

For **drinking fountains**, eleven documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) located drinking fountains on firm, level surfacing; (b) include at least two different fountain heights; and (c) provide drinking fountains that are easy to operate (e.g., lever, sensor).

For **lighting**, eight documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) incorporate streetscape or playspace specific lighting to enhance use and provide safety; and (b) ensure supporting facilities are adequately lit (e.g., car park, toilets, access paths, seating areas).

For **storage facilities**, five documents (Supplementary Table 2) recommended storage facilities to improve accessibility for families needing to bring medical equipment (e.g., oxygen cylinders, changing bags).

For **service/ assistance animals**, three documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) include a designated area on-site provided for animal care, ensuring that it is on a universal route; (b) provide spaces where service animals can relieve themselves and provide for appropriate waste disposal; (c) include signs for owners to dispose of service animal waste; (d) provide a water trough/ basin/ drinking fountain for use by service animals; and (e) provide nearby safe and shady places where service animals can wait and have a clear view of their handlers when they are not assisting them.

For **signage**, twenty-two documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) comply with following internationally specified shapes in signboards (i.e., information signboards should be rectangular; warning signboards triangular; and interdiction signboards circular); (b) include signage that is easy to read and understand (e.g., multiple methods of communication; consistent wording, font, and colouring); and (c) incorporate signage that is welcoming and child friendly (e.g., include local children in the design of signage).

Finally, for **web page/ social media**, eight documents provided recommendations (Supplementary Table 2). Recommendations included the need to: (a) ensure that the dedicated web page for the playground is universally accessible (e.g., easy to navigate, read, and understand; provide the information in multiple formats); and (b) utilise a web page and social media platform to prepare a family to visit (e.g., include directions, information, and printable flashcards).

Supplementary Tables

Supplementary Table 1: Research on inclusive playground provision

Focus of study	**Reference(s)**
Explored user perspectives	Bhuyan 2021; Black and Ollerton 2021; Hill and Chawla 2019; Lynch et al. 2020; Olsen and Dieser 2012; Prellwitz and Skär 2007, 2016; Ripat and Becker 2012; Stanton-Chapman and Schmidt 2019, 2017a, 2016; Sterman et al. 2019; Wenger et al. 2021
Investigated the perspectives of municipality representatives	Lynch et al. 2020, 2019; Prellwitz and Tamm 1999; Prellwitz, Tamm, and Lindqvist 2001; Sterman et al. 2019; Van Melik and Althuizen 2020
Reviewed policy documents	Lynch, Moore, and Prellwitz 2018; Van Melik and Althuizen 2020
Analyzed guidelines	Kim, Kim, and Maeng 2018; Lynch, Moore, and Prellwitz 2018; Lynch et al. 2019; Olsen 2015
Studied research evidence	Alsarawi 2020; Brown et al. 2021; Burke 2013; Casey 2017; Fernelius and Christensen 2017; Moore and Lynch 2015; Moore, Lynch, and Boyle 2020; Prellwitz and Lynch 2018
Developed evaluation tools to assess playground design	Dalprà 2020; Gustat, Anderson, and Slater 2020; Lynch et al. 2019; Parker and Al-Maiyah 2022
Proposed frameworks for creating inclusive playgrounds	Olsen 2015
Evaluated playground design	Lynch et al. 2019; Olsen and Dieser 2012; Perry et al. 2018; Siu, Wong, and Lam 2017; Talay, Akpinar, and Belkayali 2010

Investigated the number of children who played, and time spent playing on a universally designed playground and compared it to children playing on an inclusive playground	Stanton-Chapman et al. 2020
Designed inclusive playgrounds	Stanton-Chapman and Schmidt 2017b; Yuen 2018

Supplementary Table 2: Research on inclusive playground provision

No	Author(s), Publication year and location	Title	*Design recommendations*																				
			Location, layout, and accessibility									*Support features*											
			Location	*Parking and other ways to arrive*	*Entryway and orientation*	*Surfacing*	*Pathways*	*Wayfinding*	*Orientation in and around the space*	*Perimeter boundary*	*Supervision and surveillance*	*Seating*	*Tables/ Picnic tables*	*Spaces to gather and socialise*	*Shade and sheltered areas*	*Toilets/ Changing facilities*	*Litter bins*	*Drinking fountains*	*Lighting*	*Storage facilities*	*Service and assistance animals*	*Signage*	*Web page/ social media*
1	Alison and Wheway 2004 UK	Can play, will play: Disabled children and access to outdoor playgrounds	•	•	•	•	•	•				•		•		•							

2	DESSA 2007 Ireland	Play for all: Providing play facilities for disabled children				•	•		•		•	•		•	•							•	
3	Shackell et al. 2008 UK	Design for play: a guide to creating successful play spaces	•			•	•			•	•	•		•	•	•							
4	Touched by Olivia 2012 Australia	The principles for inclusive play										•		•	•							•	•

5	Play Wales 2016 UK	Developing and managing play spaces: A community toolkit	•	•		•	•		•	•		•		•		•			•			•	
6	Yuen 2016 China	Inclusive play space guide: Championing better and more inclusive spaces in Hong Kong	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•		•		•	

7	Pooja Hiranandani, Krishnamoorthy, and Gopal 2016 India	Breaking barriers through play: Policy guidelines and a technical manual for making play spaces inclusive		•	•	•	•			•		•	•	•	•	•	•	•	•	•		•	
8	Play Wales and Alison John and Associates 2017 UK	Creating accessible play spaces: A toolkit	•	•	•	•	•		•	•	•	•	•	•	•	•	•		•	•		•	

9	Casey and Harbottle 2018 UK	Free to play: A guide to creating accessible and inclusive public play spaces	•	•	•	•	•					•	•	•	•	•				•		•	•
10	Inclusive Play, KIDS, and Wagenfeld 2019 UK	PiPA: Plan inclusive Play Areas		•	•	•	•	•		•	•	•	•	•	•	•	•	•				•	•
11	Rick Hansen Foundation 2019 Canada	A guide to creating accessible play spaces	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•
12	Christopher and Dana Reeve Foundation n.d. USA	Toolkit for building an inclusive community playground	•	•		•	•							•	•	•							

13	Rick Hansen Foundation n.d. Canada	Let's play toolkit: Creating inclusive play spaces for children of all abilities		•	•	•	•	•	•			•	•	•	•	•	•	•				•	
14	Luce 2015 Australia	Inclusive design manual: A guide to creating play spaces which welcome children of all abilities					•		•		•	•		•								•	
15	HAGS 2018 UK	Inclusive play design guide	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•

16	Landscape Structures 2018 USA	Inclusive playspace design: Planning guide		•		•	•			•		•		•	•	•						•	
17	HAGS 2019 UK	Guide to creating inclusive playgrounds	•	•	•					•	•		•			•			•			•	•
18	Playworld 2019 USA	Inclusive play design guide	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•			•	•	•
19	Kompan Play Institute 2020 Denmark	Play for all: Universal design for inclusive playgrounds	•	•	•	•	•		•	•		•	•	•		•						•	

20	Dunn, Moore, and Murray 2003 UK	Developing accessible play space: A good practice guide	•	•	•	•	•	•		•	•	•	•	•	•	•			•	•		•	
21	State of Victoria 2007 Australia	The good play space guide: "I can play too"	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•				•	
22	NSW Government 2019 Australia	Everyone can play: A guideline to create inclusive playspaces	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	
23	Government of South Australia n.d. Australia	Inclusive play: Guidelines for accessible playspaces	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•	•

24	PlayCore, GameTime, and Utah State University 2008 USA	EveryBODY plays!	•	•		•	•		•	•	•	•		•	•						•		
25	PlayCore and Utah State University 2016 USA	Me2: 7 principles of inclusive playground design		•		•	•	•	•	•	•	•		•	•	•		•			•		
26	CABE Space 2008 UK	Public space lessons: Designing and planning for play	•											•									

27	Liedtke 2016 USA	Creating inclusive play and community spaces: An out-of-the-box approach to social and emotional inclusion	•		•	•	•					•	•	•	•				•				

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Chapter Six: Study IV, Paper IV

Moore, A., Lynch, H., & Boyle, B. (2022). A national study of playground professionals universal design implementation practices. *Landscape Research, 47*(5), 611-627. https://doi.org/10.1080/01426397.2022.2058478

The first (Study I, Paper I) and second (Study II, Paper II) scoping review studies identified a need to extend knowledge on Universal Design (UD) as it applies explicitly to public playgrounds. Moreover, the third scoping review study (Study III, Paper III) asserted that further research with public playground "creators" was required to overcome inequalities faced by diverse users and strengthen the knowledge base on the applicability of UD for public playground design. Therefore, in response to the overall aim of this thesis and informed by emergent findings from the three scoping review studies, this qualitative descriptive cross-sectional survey aimed to provide a comprehensive "first impression" of the ways in which UD is understood and implemented by a national sample of playground professionals (i.e., those that plan, design, and/or provide public playgrounds) in the Republic of Ireland (**Study Aim 4**).

With supervision and guidance from her supervisory team (Dr Helen Lynch and Dr Bryan Boyle), the research design, data collection, and data analysis were conducted by the PhD candidate. The PhD candidate wrote this paper with supervisory support and mentorship from her supervisory team. This study was published online by the Landscape Research Journal on 06 April 2022 following two rounds of revisions in response to peer review feedback. Revisions primarily related to: (i) making the significance of the paper clearer in terms of the journal and its readership; (ii) clarifying the representativeness of the sample, including providing reflections on its limitations; and (iii) presenting the results more succinctly.

The study is presented here as it appears in print; hence, as before, there is some overlap with the previous sections of this thesis. The figures and tables are presented at the end of the chapter.

Title

A national study of playground professionals Universal Design implementation practices

Abstract

Globally, Universal Design (UD) is promoted as an evidence-informed approach for planning and designing accessible and inclusive public playgrounds, which are valuable sites for outdoor play in child-friendly cities. However, it remains unclear the extent to which UD has been implemented in public playgrounds. The purpose of this study was to explore the extent to which UD is implemented, from the perspectives of playground professionals in the Republic of Ireland. A descriptive, cross-sectional online survey was used to gather data. Data analysis revealed that playground professionals recognise the importance of UD for planning, designing, and providing public playgrounds for inclusion, and implement UD in various ways. Still, a lack of knowledge and good practice guides for embedding UD, constitute significant barriers. Numerous opportunities, initiatives and training prospects were identified to better support the implementation of UD. Moreover, further research with 'professional experts' and 'user-experts' is required to strengthen socio-spatial inclusion.

Keywords

playground; inclusion; universal design; inclusive design; child-friendly cities; outdoor play

Main text

Play is such an important part of childhood that it is enshrined as a fundamental human right of all children in Article 31 of the United Nations Convention on the Rights of the Child (UNCRC) (United Nations, 1989). The value of play for children's development, health, and wellbeing is increasingly recognised (Milteer, Ginsburg, Mulligan, & Committee On Psychosocial Aspects Of Child & Family Health, 2012; Moore & Lynch, 2018), and outdoor play is a significant contributor to these positive outcomes (Loebach, Sanches, Jaffe, & Elton-Marshall, 2021; Tremblay et al., 2015). Outdoor play refers to play that takes place outside, and is typically active, freely chosen, process rather than outcome oriented, and intrinsically motivating (Bundy,

1993). When children play outdoors, they tend to be physically active (Gray et al., 2015), think creatively (Clements, 2004), solve problems (Burdette & Whitaker, 2005), interact with peers (Dowdell, Gray, & Malone, 2011), learn important motor, social, emotional and cognitive skills (Brussoni et al., 2015; Burdette & Whitaker, 2005; Clements, 2004), and develop a more positive relationship with the natural environment (Bixler, Floyd, & Hammitt, 2002).

Despite the known benefits, researchers have noted a decline in children's outdoor play in recent decades (Dodd, FitzGibbon, Watson, & Nesbit, 2021; Loebach et al., 2021; Tremblay et al., 2015). Evidence suggests that multiple ongoing societal shifts have contributed to this decline, such as lifestyle changes (Tremblay et al., 2015), urbanisation (Karsten, 2005), neighbourhood social and environmental conditions (Loebach & Gilliland, 2016; Ross, Wood, & Searle, 2020), children's safety and parental concerns (Brussoni, Olsen, Pike, & Sleet, 2012; Brussoni et al., 2020), and changing social norms around children's mobility (Kyttä, Hirvonen, Rudner, Pirjola, & Laatikainen, 2015; Tremblay et al., 2015). The subsequent effects on children's health, development, and wellbeing are concerning as researchers have attributed the rise of childhood obesity (Tremblay et al., 2015) and childhood psychopathology (Gray, 2011) at least partly to the reduction in outdoor play.

Consequently, policymakers, practitioners, and communities are working together to mediate this impact, by delivering better play opportunities in urban locations (Arup & The Lego Foundation, 2020; Vincelot, 2019) as 60 per cent of the world's children are projected to live in cities by the year 2030 (UNICEF, 2019). Target 11.7 of Sustainable Development Goal 11 states 'by 2030, provide universal access to safe, inclusive, and accessible, green and public spaces…' (United Nations General Assembly, 2015, p. 22). One way to ensure equitable play opportunities in public open space is through the planning and provision of playgrounds (Jansson, 2010); thus, those that plan, design, and/or provide (referred to hereafter as playground professionals) public playgrounds are expected to provide accessible and inclusive public playgrounds, which is the primary focus of this paper.

Public playgrounds are usually located in neighbourhoods or at locations that playground patrons travel to (Daniels & Johnson, 2009), and offer structured, free-of-

charge, safe spaces for children to play (Lundman, 2021). They typically contain play equipment and structures with paths to and between equipment (Brown et al., 2021), and have evolved in recent decades to include natural materials and landscaped elements alongside equipment designed for children (Herrington & Studtmann, 1998; Woolley & Lowe, 2013). The design of playgrounds, however, is often shaped by an idealised norm of children's bodies, mobilities, and abilities (Brown et al., 2021). Subsequently, many children and their families, who do not fit within such norms, experience public playgrounds as sites of spatial and social exclusion because of physical barriers to access and social barriers to participation (Lynch, Moore, Edwards, & Horgan, 2020; Prellwitz & Skär, 2007, 2016; Ripat & Becker, 2012).

Nevertheless, the right of all children to play and to access the physical environment for play is recognised in Article 31 of the UNCRC (UN, 1989) and further supported in the UN Convention on the Rights of Persons with Disabilities (UNCRPD) (United Nations, 2006). However, challenges in implementing these rights prompted the publications of General Comment No. 17 (GC17) on play and leisure (Committee on the Rights of the Child, 2013) and of General Comment No. 2 (GC2) on accessibility (Committee on the Rights of Persons with Disabilities, 2014) to address society's failure to protect and provide for children's right to play and disability rights more broadly. Both General Comments endorse Universal Design for providing conceptual guidance for designing environments (including public play environments) that are accessible and inclusive for all.

The term Universal design (UD) was first introduced by Ronald Mace in 1985 to describe 'a way of designing a building or facility, at little or no extra cost, so that it is both attractive and functional for all people, disabled or not' (Mace, 1985, p. 147). Later, the UNCRPD defined UD as 'the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design' (United Nations, 2006, p. 4). While related design concepts exist, for example, inclusive design (Coleman, 1994; Imrie & Hall, 2001) and design for all (European Institute for Design & Disability, 2004), what differentiates UD is that it is underpinned by seven principles and eight goals (Table 1).

Although UD has become widely accepted by supranational institutions such as the UN and the World Health Organisation, researchers within various design disciplines acknowledge that the implementation of UD is often hampered by knowledge-based, attitudinal, and practical barriers (Ielegems, Herssens, Nuyts, & Vanrie, 2019). Knowledge-based barriers include a lack of knowledge on UD (Dong, Clarkson, Ahmed, & Keates, 2004; Goodman, Dong, Langdon, & Clarkson, 2006) and limited education in UD (Goodman-Deane, Langdon, & Clarkson, 2010; Manley, de Graft-Johnson, & Lucking, 2011). Attitudinal barriers include associating UD merely with accessibility (Ielegems et al., 2019; Ostroff, 2011; Steinfeld & Maisel, 2012), incorrect perceptions that UD sacrifices aesthetics, raises costs, requires a more complex design process, and slows down time to market (Dong et al., 2004; Goodman et al., 2006; Goodman-Deane et al., 2010). Practical barriers include time and budget limitations, the client's influence, or the company's culture (Dong et al., 2004; Goodman et al., 2006), barriers to evaluation (O Shea, Pavia, Dyer, Craddock, & Murphy, 2016), and limited economic incentives and recognition in design awards (Heylighen, Schijlen, Van der Linden, Meulenijzer, & Vermeersch, 2016; Manley et al., 2011).

Within this context, barriers for implementing UD in the built environment also extends to playground design. Knowledge-based barriers include a lack of UD knowledge among playground professionals (Lynch, Moore, Edwards, & Horgan, 2019, Lynch et al., 2020; Prellwitz, Tamm, & Lindqvist, 2001; Prellwitz & Tamm, 1999; Sterman, Naughton, Bundy, Froude, & Villeneuve, 2019; Woolley & Lowe, 2013), a lack of evidence on the effectiveness of UD (Moore, Lynch, & Boyle, 2020; Moore & Lynch, 2015), and inconsistent terminology being used to describe to describe non-discriminatory planning and design concepts (Moore, Boyle, & Lynch, 2022). Attitudinal barriers include incorrect perceptions that UD raises costs (Lynch et al., 2019). Practical barriers include lack of play-policy that incorporates UD (Lynch, Moore, & Prellwitz, 2018; Van Melik & Althuizen, 2020), and limited efforts to translate UD principles to include play value principles (Casey, 2017; Lynch et al., 2018). Also, among landscape architects, there is a consensus that there is a need for play-specific approaches to playground design (Jansson, 2010), a robust evidence-based (Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2015), and good quality urban parks (Guo & Mell, 2021).

Therefore, this review identifies that many communities are struggling to implement UD and facilitate the provision of accessible and inclusive public playgrounds in urban locations. Yet, UD is endorsed by the UN for providing conceptual guidance for designing environments (including public play environments) that are accessible and inclusive of all. Instrumental in ensuring the implementation of UD are those responsible for the design, building, and commissioning of public playgrounds. Thus, there is an urgent need to explore the ways in which UD is understood and implemented by playground professionals to overcome the inequalities faced by diverse children and families in public playgrounds. While some evidence exists concerning how UD is understood and implemented by playground professionals in the Republic of Ireland (Lynch et al., 2019, 2020), these studies were limited to one urban location.

Therefore, this study aims to provide a comprehensive 'first impression' of the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland and accordingly, lay the groundwork for future research. This study aims at addressing the following research questions: (1) how is UD understood? (2) in what ways is UD implemented? (3) what legislation, policies, and/or guidance documents are utilised? (4) what are the opportunities and barriers to implementing UD? and (5) what training is important to support the implementation of UD? These questions are important for generating awareness and informing the field of landscape research and its allied fields for future decisions that can impact the planning, designing, and provision of accessible and inclusive public playgrounds, in sustainable child-friendly cities.

Methodology

Study design

A descriptive, cross-sectional online survey was used to gather data. Permission to undertake the study was granted by the Social Research Ethics Committee, University College Cork, in December 2019 (Log 2019-195).

Study setting

The Republic of Ireland is divided over four provinces (Munster, Leinster, Ulster, and Connacht) with 31 local authorities that are responsible for a range of local services,

including public playgrounds. In 2012, the Department of Children, Equality, Disability, Integration, and Youth established the Local Authority Play and Recreation Network (LAPRN) which comprises of key local authority staff responsible for the local delivery of play and recreation services (including public playgrounds).

Questionnaire

Following a comprehensive review of the academic literature (Moore et al., 2020) and grey literature [Manuscript submitted for publication], the research team developed a questionnaire consisting of 26 items for the study. The draft questionnaire was reviewed by two UD experts, from the Centre for Excellence in Universal Design in Ireland. The revised questionnaire was pilot tested with four professionals with knowledge on the design of built environments and UD to identify possible operational errors (it was not pilot tested with playground professionals so that potential participants would not be excluded in this study).

The final questionnaire consisted of 15 quantitative items (closed questions including multiple choice and Likert scales) and 11 qualitative items (open-ended questions).

Sampling

Purposive sampling techniques were employed, and recruitment email invitations, with a link to the questionnaire, were sent to sixty groups (Table 2). A gatekeeper responsible for the LAPRN distributed the survey to LAPRN members. Also, eleven individual playground professionals were contacted directly. Snowball sampling was encouraged; thus, potential participants were contacted directly by the researcher or via gatekeeper(s).

Data collection

Data were collected via Google Forms through an anonymous link distributed to playground professionals in April and May 2021 (7-weeks). From the outset, potential participants were provided with information concerning the research purpose, confidentiality of information, and advised that by completing and submitting the survey they were consenting to participate.

Data analysis

For the 15 quantitative items, descriptive statistics were used to describe, synthesise, and summarise the data. Answers to the 11 qualitative items were analysed using descriptive qualitative content analysis. Data analysis was led by the first author and confirmed by the remaining authors.

Results

36 playground professionals from all provinces in the Republic of Ireland completed the survey. Given the multiple routes to distributing the survey, it was not possible to determine a response rate. Also, because this survey was anonymous, no information was obtained regarding non-responders.

A summary of respondents' demographics and practice contexts is presented below, and main results are presented under the heading of each research question.

Respondents' demographics and practice contexts

Data of 36 playground professionals were included (Table 3).

Most respondents (n = 23; 63.9%) planned, designed, and provided playgrounds, and had 0–5 years' (55.6%) professional experience. A further thirteen respondents (36.1%) listed their roles as 'other', which included, for example: 'playground inspector/trainer', and 'play advocate'.

Respondents mainly practiced in the Leinster and Munster provinces (n = 26; 72.2%); six respondents (16.7%) had a broader remit which included multiple provinces in the Republic of Ireland (including Connacht) and multiple countries. One respondent (2.8%) listed their role in education. Information was also sought relating to respondents' qualifications. Half of the respondents had qualifications in engineering (16.7%), architecture (16.7%), and landscape and/or horticulture (16.7%).

Main results

How is UD understood?

When asked to describe what they understand by the term UD, most respondents (n = 22; 61.1%) described UD as designing for: different abilities and/or disabilities, everyone, and for inclusion (Table 4).

Moreover, respondents were asked how important UD is for public playground design (Table 4). Most respondents reported that UD was very important (n = 32, 88.9%); however, when asked who UD playgrounds are important for, only five respondents (13.9%) noted that UD playgrounds were for everyone. The remaining respondents defined their importance relating to specific characteristics, which is perhaps unsurprising when considering the ways in which UD is understood.

Also, when asked to determine what percentage of projects require knowledge about UD, only thirteen respondents (36.1%) reported that all projects require knowledge (Table 4). Also, thirteen respondents (36.1%) did not specify a percentage or deemed UD not applicable.

Overall, results suggest that although respondents value and adopt UD in principle, respondents seem to view UD as something to apply in specific circumstances as opposed to a standard design strategy for every playground. While a lack of knowledge has previously been identified as a barrier, results from this study reveal that a lack of understanding and the subsequent lack of UD knowledge meant that the design of playgrounds that benefit everyone was potentially hindered.

What legislation, policies, and/or guidance documents are utilised?

Respondents were asked to comment on what legislation and/or policies they refer to, relevant to UD and inclusion. Table 5 lists the documents identified by most respondents (n = 29; 80.6%). However, almost one-fifth of the respondents (n = 7; 19.4%) determined that legislation/policy documents were not applicable or did not identify any documents.

Also, respondents were asked to identify what guideline documents they refer to. Despite an array of guideline documents listed by most respondents (n = 25; 69.4%), guideline documents were often listed interchangeably with legislation and/or policy documents (Table 5). Yet, eleven respondents (30.6%) determined that guidance documents were not applicable or did not identify any.

Overall, results suggest that most respondents value legislative, policy, and guidance documents; however, many respondents did not differentiate between documents that

are mandatory (legislation and policy), or voluntary/optional (guidance documents). This lack of differentiation may be attributed to the lack of play-policy that incorporates UD, identified previously, and subsequently many playground professionals relied on guidance documents to support their practices.

In what ways is UD implemented?

Respondents were asked to provide examples of how they implemented UD in practice. Most respondents (n = 30; 83.3%) provided examples including: providing accessible and/or inclusive play equipment and/or spaces, consulting with stakeholders, making playgrounds accessible, selecting specific elements for a site, implementing UD at different design stages, and making playgrounds inclusive.

Also, respondents were asked to rate, the extent to which they address and/or are consulted on five UD issues (listed in Figure 1). Most respondents (n = 25; 69.5%) reported that they often or always embed UD into the design process and go beyond minimum accessibility legislation.

Overall, results suggest that most respondents go beyond mere accessibility legislation and implement UD in various ways; however, the implication of implementing UD is rarely or never a matter of discussion (n = 11, 30.5%) which potentially does not facilitate opportunities to learn from each other. This may subsequently contribute to a lack of evidence on the effectiveness of UD, previously identified in the literature review.

Respondents were subsequently asked to rate the extent to which they prioritise UD over six other factors (listed in Figure 2). One quarter of respondents (n = 9; 25.0%) reported that they always prioritise UD over cost, play and play value. Still, half of the respondents (n = 18; 50.0%) reported that they never prioritise UD over safety, suggesting that a 'standards first' approach continues to dominate in public playgrounds, a phenomenon previously described by Ball et al. (2019).

Also, respondents were asked to rate the extent to which they implement UD in different design stages (listed in Figure 3). More than half of the respondents (n = 21; 58.3%) reported that they always implement UD at stages 1, 3, and 4. Eleven

respondents (30.6%) reported that UD was mostly not applicable or that they never implement UD at stage 6.

What are the opportunities and barriers to implementing UD?

Respondents were asked to rate, on a scale of importance, the extent to which seven factors (listed in Figure 4) were important for implementing UD. Factors respondents considered to be most important (rated very important) were good practice guides for embedding UD (n = 27; 75.0%) along with play and play value (n = 26; 72.2%).

In contrast, respondents were asked to rate, on a scale of agreement, the extent to which they perceived nine factors (listed in Figure 5) as a barrier to implementing UD. The most perceived barriers (rated strongly agree or agree) were a lack of knowledge on UD (n = 25; 69.4%) and a lack of good practice guides for embedding UD (n = 24; 66.7%).

Respondents were subsequently asked to rate, on a scale of importance, the extent to which nine initiatives and practices (listed in Figure 6) would better support the implementation of UD. Initiatives and practices respondents considered to be most important (rated 8 and above on a nine-point scale) were good practice guides for embedding UD (n = 27; 75.0%) and user involvement (n = 27; 75.0%).

In sum, results suggest that respondents considered not only the built environment, but also what happens in public playgrounds (i.e. play). While Watchorn et al. (2021) recently asserted that what people do in built environments is rarely considered, results from this study show that respondents do consider what people do in playgrounds. Nevertheless, a lack of knowledge on UD and the lack of availability of good practice guides for implementing UD constitute significant barriers to implementing UD; this lack of availability extends upon previously known barriers, identified in the literature review. Thus, it is not surprising that respondents identified good practice guides and user involvement as important to address these barriers and support the implementation of UD.

What training is important to support the implementation of UD?

Given that a lack of knowledge was identified as a barrier, most respondents reported that they would (n = 26; 72.2%) or may be (n = 7; 19.4%) interested in further education to support the implementation of UD. Two respondents identified that they would not be interested, while one respondent noted that there is '…no point in attending these workshops if decision makers don't'.

Overall, further education was particularly desired (rated 6 and above on a seven-point scale) on knowledge on good design features that promote inclusion (n = 30; 83.3%) and knowledge on how to plan/design/provide inclusive play options (n = 29; 80.6%) (Figure 7). While a lack of education on UD was previously acknowledged as a barrier to implementing UD, these results offer specific direction on pertinent areas that need to be addressed in future education efforts.

Almost all playground professionals identified that a half-day (n = 19; 52.8%) or full day (n = 16; 44.4%) training would suffice; one respondent (2.8%) identified a longer duration. In-person training was identified as the most preferred method (n = 20; 55.6%), followed by online e-courses (n = 11; 30.6%).

Discussion

This study aimed to create a comprehensive 'first impression' of the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland and, on this basis, lay the groundwork for future research. As we embark upon the 30th anniversary of the ratification of the UNCRC in Ireland in 1992, these results offer insights into the ways in which UD is understood and implemented, and provides policy makers, researchers, and educators with the information needed to more effectively address the barriers that playground professionals face in implementing UD.

Data analysis revealed that playground professionals, from diverse professional backgrounds, recognise the importance of UD for public playgrounds. However, knowledge-based barriers meant that few respondents recognised the importance of UD playgrounds for everyone. Instead, a strong reference to designing for disability was evident and UD was viewed as something to apply in specific circumstances.

However, at the core of UD is the commitment to inclusion and the provision of environments that can fully be experienced by all people irrespective of age, size, gender, class, or (dis)ability (Disability Act, 2005; Gossett, Mirza, Barnds, & Feidt, 2009). Therefore, designing for disability is in stark contrast to the underlying philosophy of UD.

Moreover, few respondents acknowledged that all public playground projects require knowledge about UD. In fact, more than one-third of respondents identified that UD was not applicable to public playground design. However, UD for public playground design is endorsed by GC17 (Committee on the Rights of the Child, 2013), GC2 (Committee on the Rights of Persons with Disabilities, 2014), the UNCRPD (United Nations, 2006), and the new European standard EN 17210:2021 (National Standards Authority of Ireland, 2021). Thus, all public playground projects in the Republic of Ireland should require knowledge about UD.

Although knowledge-based barriers to implementing UD, confirms findings from previous studies with playground professionals (Lynch et al., 2019, 2020; Prellwitz et al., 2001; Prellwitz & Tamm, 1999; Sterman et al., 2019; Woolley & Lowe, 2013), practical barriers such as a lack of good practice guidance documents was a new finding. Confusion existed among the respondents as a sizeable proportion of them did not refer to guideline documents and sometimes failed to differentiate between what is mandatory (legislation and policy) and what is voluntary or optional (guidance documents). Given the strong focus on safety, it could be argued that the practices of these playground professionals were influenced primarily by a legislative, policy, and/or a standard imperative, which have different sets of outcomes to guidance documents which account for the entirety of playground design, as opposed to a specific component, such as safety.

However, a recent review of guidance documents in the international context found that guidance documents potentially make a fundamental contribution to the design of public playgrounds for inclusion [Manuscript submitted for publication]. Thus, the establishment of Irish guidelines specifically for an Irish context could overcome current barriers, and act as a middle ground for implementing UD. In this way, the establishment of guidelines, that also includes updating the National Play Policy in

Ireland (National Children's Office, 2004), needs to represent the entirety of playground design, with consideration for legislation, policy, and standards, as well as UD, play, and play value.

Despite these challenges, there are glimpses of hope. Indeed, a significant proportion of respondents identified that they go beyond mere accessibility legislation and implement UD in various ways and at different design stages, albeit inconsistently. This contrasts with previous research in other contexts that found that design professionals associate UD merely with accessibility (Lelegems et al., 2019; Ostroff, 2011; Steinfeld & Maisel, 2012). Moreover, although Watchorn et al. (2021) recently asserted that the current discourse on UD and the built environment focuses on the person and the environment, with much less attention being directed towards what people do in built environments, consideration for wider aspects of provision was evident; specifically, play and play value were identified as very important.

Also, several efforts at the international, national, and local levels currently place UD at the forefront of the political and social agenda (Hitch, Larkin, Watchorn, & Ang, 2012). As mentioned, GC17 (Committee on the Rights of the Child, 2013), GC2 (Committee on the Rights of Persons with Disabilities, 2014), the UNCRPD (United Nations, 2006), and EN 17210:2021 (National Standards Authority of Ireland, 2021) endorse UD. Also, Ireland's ratification of the UNCRPD in 2018 (United Nations, 2006), will further support the implementation of UD. Furthermore, the Community Participation (Disability) (Miscellaneous Provisions) Bill, 2019) currently before the Irish Government promotes the concept of UD and aims to expand upon the existing building regulations in Ireland to improve inclusiveness across Ireland.

Therefore, there is a growing awareness of, and demand for, public playgrounds that support participation and inclusion in urban contexts, and for playground professionals who are equipped to take up the challenge of implementing UD. In this study, respondents proposed numerous opportunities, initiatives, and training prospects to better support the implementation of UD. However, there is a significant need to embed knowledge on UD in education for playground professionals. Given the multi-disciplinary nature of the profession, as confirmed by the numerous disciplines

represented in this study, this would warrant a multidisciplinary approach to educational provision and an interdisciplinary commitment to child-friendly cities.

While this study represents a rich insight into the ways in which a national sample of playground professionals in the Republic of Ireland understand and implement UD, there are some limitations which impact upon the extent to which the results can be generalised. First, despite the breadth of recruitment strategies used, the overall population drawn from is very small as it represents a niche element of the design industry. Second, as this was a voluntary, online-based purposive and snowball sample study, no information was gathered on non-responders to the survey. As non-responders may be systematically different to the responders, results of this study should be interpreted accordingly. Finally, this survey involved playground professionals in the Republic of Ireland, thus, expanding this survey research to a larger sample (within and beyond the Irish context) is warranted, alongside more qualitative in-depth research. Specifically, further international research with 'professional experts' (i.e. playground professionals) and 'user-experts' (i.e. diverse public playground users and non-users) is required to strengthen knowledge on socio-spatial inclusion in sustainable child-friendly cities.

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Figure captions

Figure 1. UD implementation
Figure 2. How UD is prioritised over other factors
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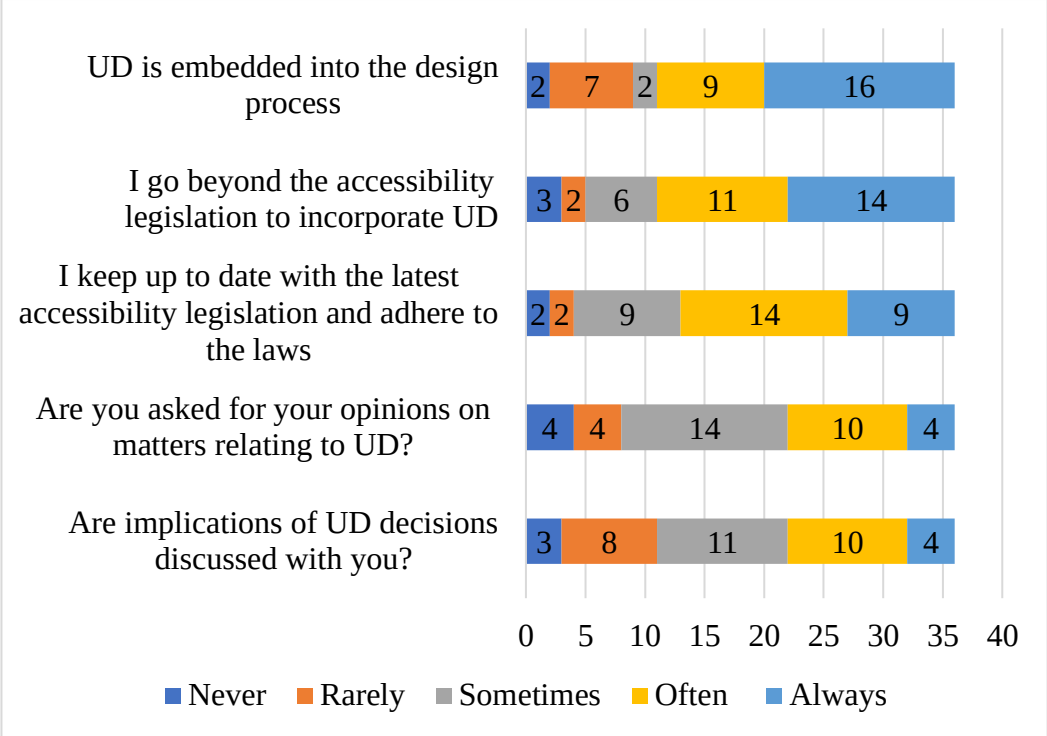


Figure 1. UD implementation

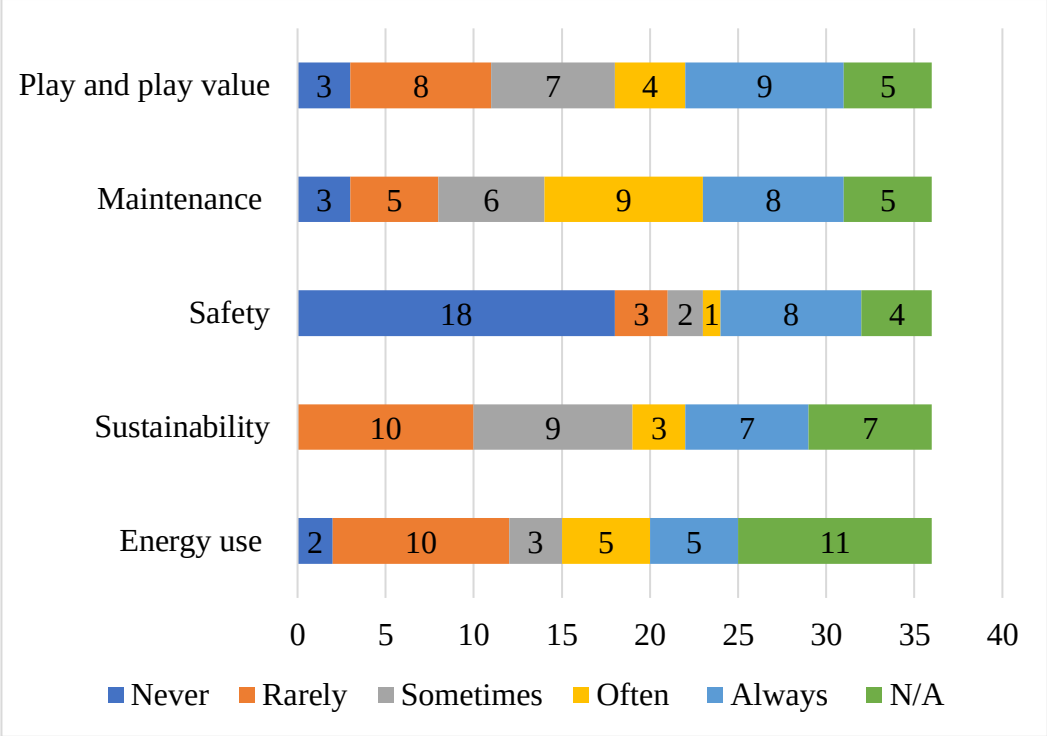


Figure 2. How UD is prioritised over other factors

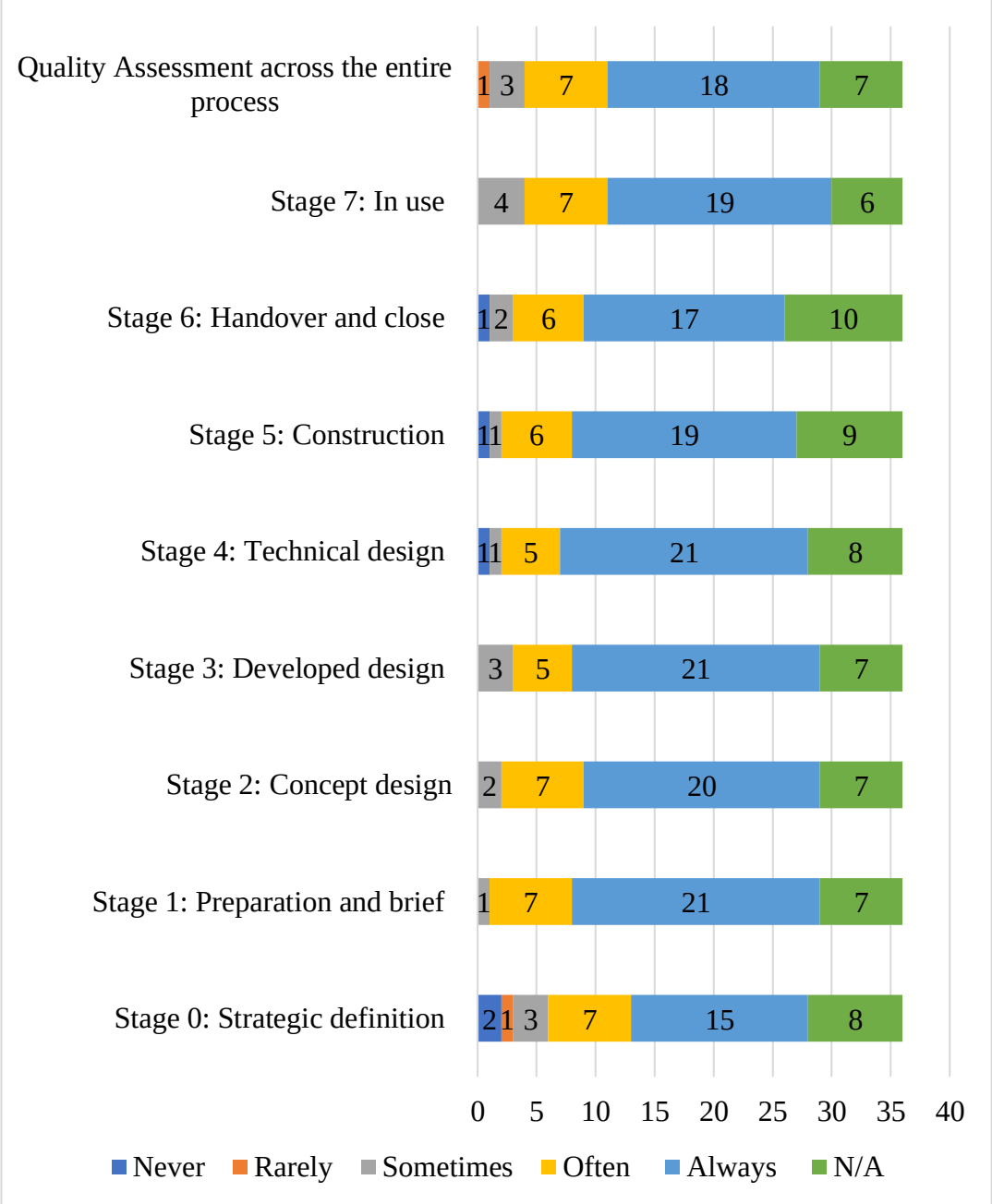


Figure 3. The design stages whereby UD is implemented

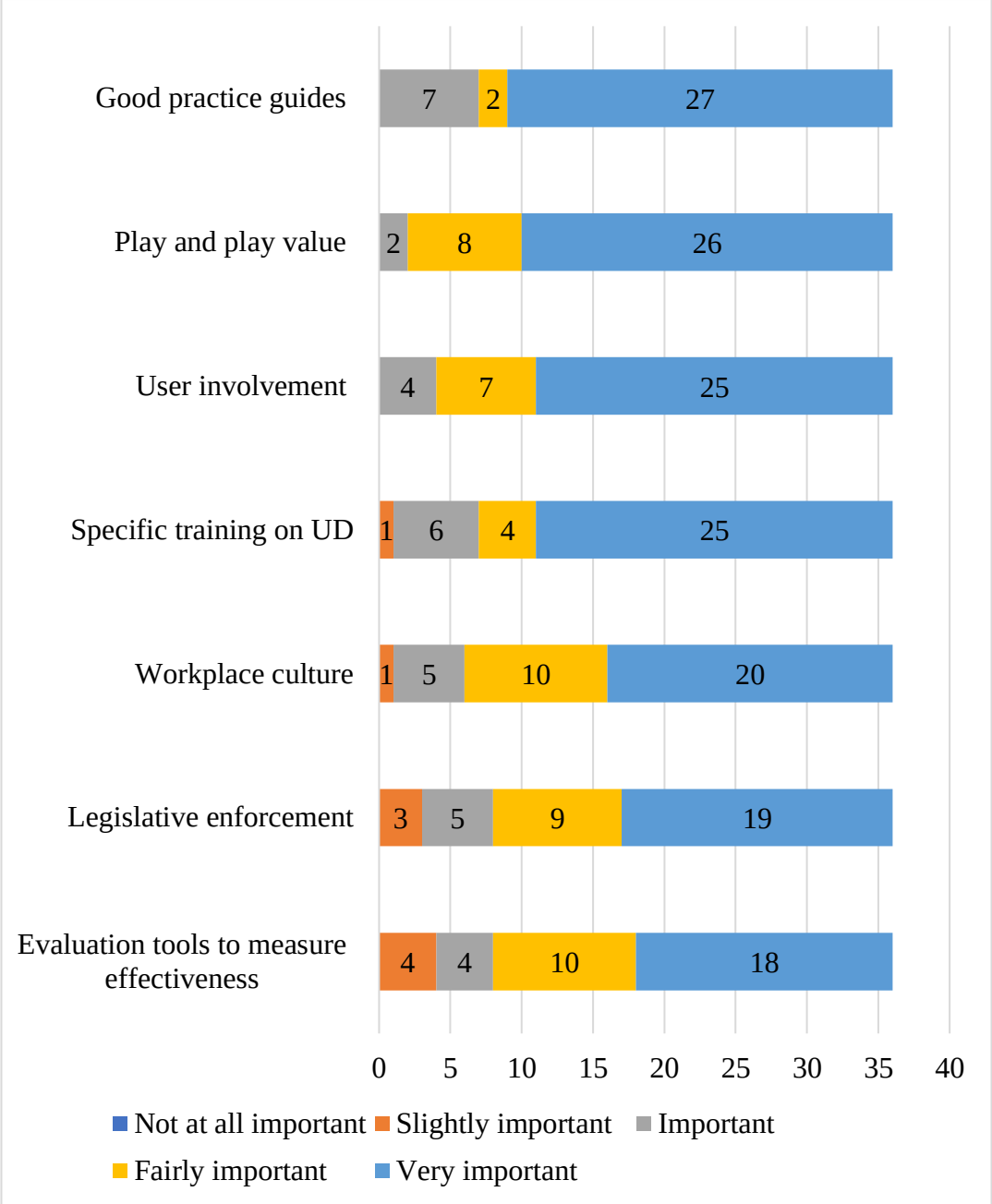


Figure 4. Important factors for implementing UD

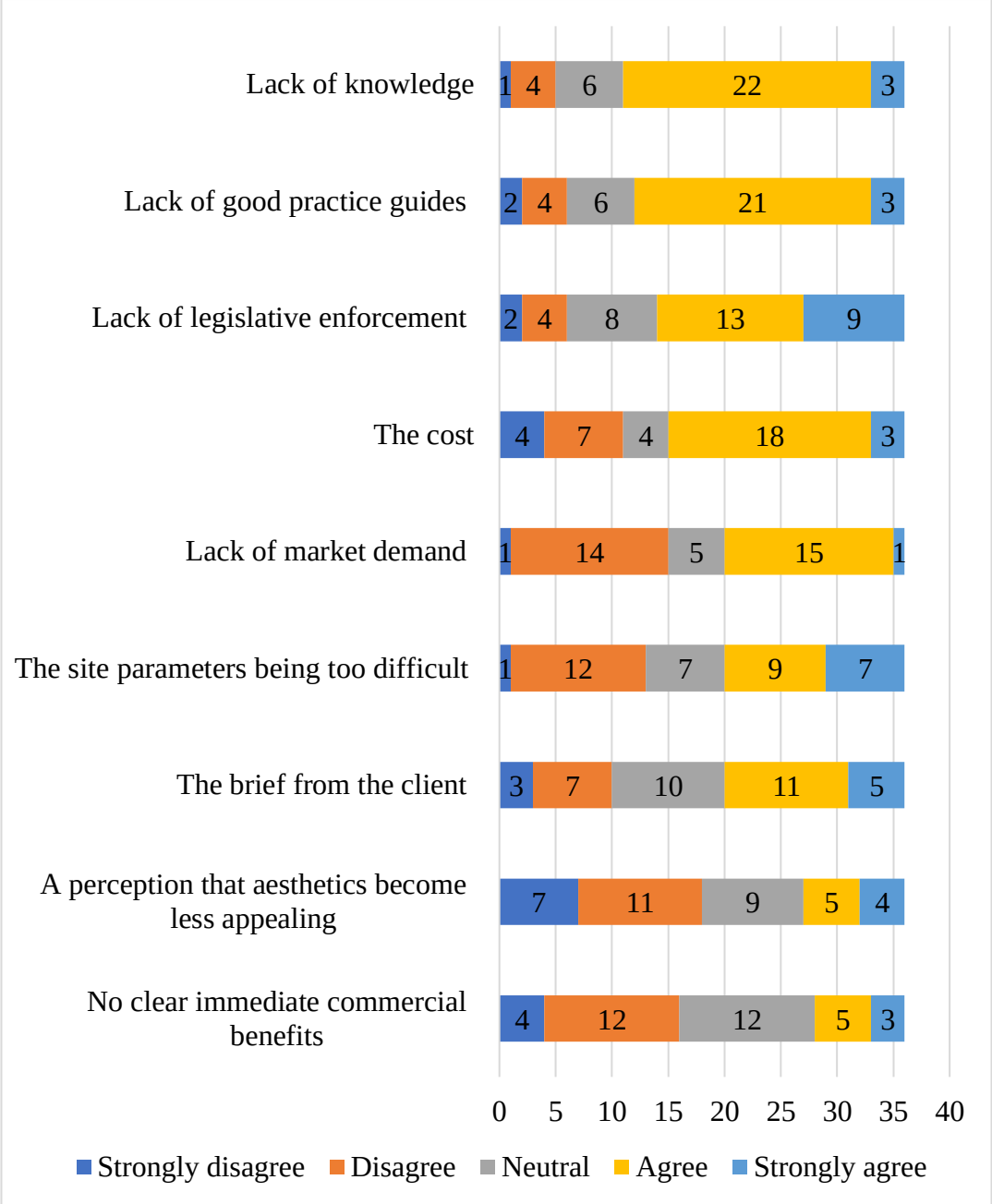


Figure 5. Perceptions regarding barriers to implementing UD

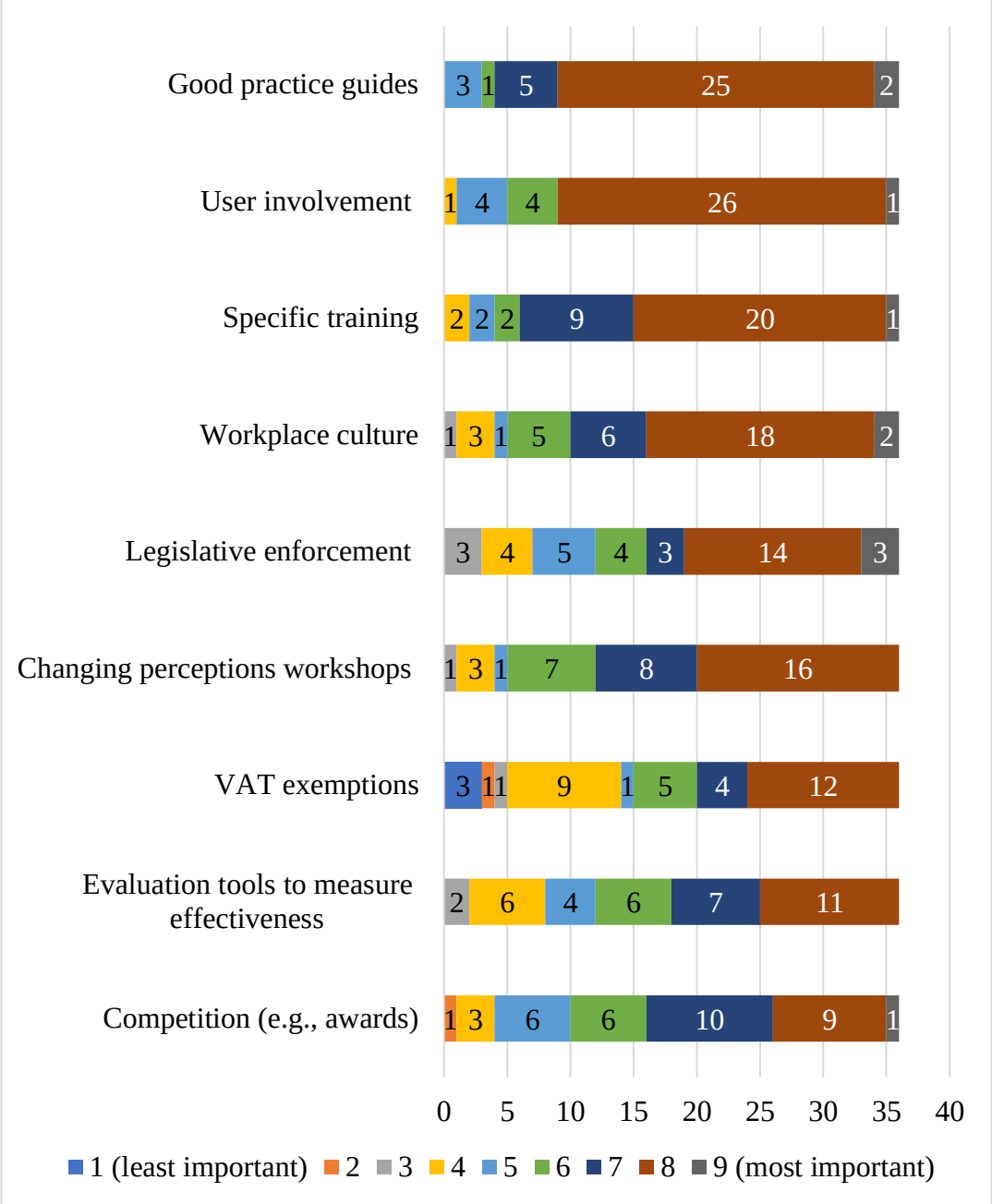


Figure 6. Initiatives and practices to support the implementation of UD

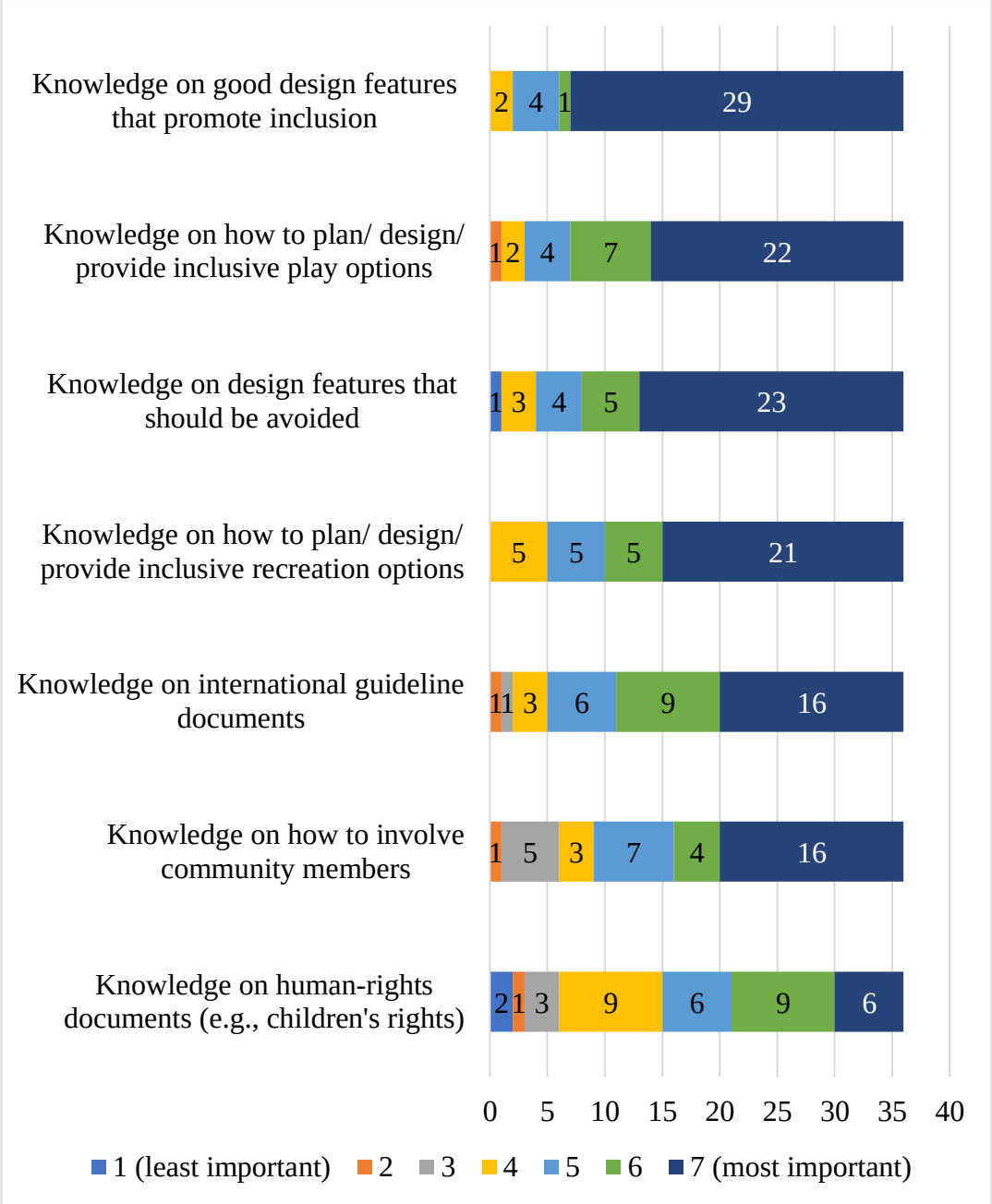


Figure 7. Further education topics deemed most and least important

Tables

Table 1. Seven principles and eight goals of Universal Design

Principles of UD (Connell et al., 1997)	**Goals of UD (Steinfeld & Maisel, 2012)**
1. Equitable Use 2. Flexibility in Use 3. Simple and Intuitive Use 4. Perceptible Information 5. Tolerance for Error 6. Low Physical Effort 7. Appropriate Size and Space for Approach and Use	1. Body Fit 2. Comfort 3. Awareness 4. Understanding 5. Wellness 6. Social Integration 7. Personalisation 8. Cultural Appropriateness

Table 2. Groups contacted for sampling

Groups	**n**
Local authorities	31
Playground suppliers	14
Institutes for architects, landscape architects, planners, and designers	4
Housing councils and associations	4
Forestry organisation	1
Government departments	3
Play organisations responsible for the promotion of children's play in Ireland	2
Playground safety organisation	1

Table 3. Respondents' demographics (n = 36)

Role	**n (%)**
Playground planner	5 (13.9)
Playground designer	5 (13.9)
Playground provider	13 (36.1)
Other	13 (36.1)
Years' professional experience in planning/ designing/ providing playgrounds	**n (%)**
0 – 5	20 (55.6)
5 – 10	4 (11.1)
10 – 15	2 (5.6)
15 – 20	6 (16.7)
20 or more	4 (11.1)
Practice setting(s) in Ireland	**n (%)**
Leinster	16 (44.4)
Munster	10 (27.8)
Connacht	0
Ulster	3 (8.3)
Other	7 (19.4)
Educational background/ qualification(s)	**n (%)**
Engineering	6 (16.7)
Architecture	6 (16.7)
Arts	5 (13.9)
Landscape architecture	4 (11.1)
Landscape and/or horticulture	4 (11.1)
Sports and/or leisure	3 (8.3)
Other *Note: six respondents named their qualifications (e.g., administration), two respondents listed non-specific qualifications (e.g., 'Level 8')*	8 (22.2)

Table 4. Understandings and applicability of UD for public playgrounds

	Description	**n (%)**
Understandings of UD		
Respondents described UD as designing for …	Different abilities and/or disabilities	8 (22.2)
	Everyone	7 (19.4)
	Inclusion	7 (19.4)
	Physical accessibility	5 (13.9)
	Usability	4 (11.1)
	Different ages and abilities	3 (8.3)
	Opportunities for participation	1 (2.8)
	Other	1 (2.8)
Importance of UD		
On a scale of 1 to 5, how important is UD?	1 (not at all important)	0 (0.0)
	2	0 (0.0)
	3	1 (2.8)
	4	3 (8.3)
	5 (very important)	32 (88.9)
Who are UD playgrounds important for?	Everyone	5 (13.9)
	‘Age’	19 (52.8)
	‘Age and ability’	6 (16.7)
	‘Ability and/or disability’	6 (16.7)
Knowledge about UD		
What percentage of projects require knowledge about UD?	100%	13 (36.1)
	90%	1 (2.8)
	80%	2 (5.6)
	50%	2 (5.6)
	40%	1 (2.8)
	10%	2 (5.6)
	2%	1 (2.8)
	100% accessible	1 (2.8)
	Not specified	7 (19.4)
	Not applicable	6 (16.7)

Table 5. Legislation, policy, and/or guidance documents utilised

	Documents	**n (%)**
Legislation and/or policy documents	Policy documents (e.g., county specific playground policies)	16 (44.4)
	Disability Act	8 (22.2)
	Playground standards (EN1176; EN1177)	8 (22.2)
	Safety standards and guidelines	7 (19.4)
	Building regulations	6 (16.7)
	National Play Policy	5 (13.9)
	United Nations Conventions (UNCRC; UNCRPD)	5 (13.9)
	Equal Status Act	5 (13.9)
	National Disability Authority Guidelines	3 (8.3)
	Other (e.g., National Recreation Strategy, Healthy Ireland Plan)	15 (41.7)
	Not applicable	4 (11.1)
	None listed	3 (8.3)
Guidance documents	Guideline documents for UD in the general built environment as well as playground specific guidelines (e.g., Building for Everyone, Everyone Can Play, Inclusive Play Design Guide)	11 (30.6)
	Publications, best practice examples, relying on the expertise of playground installers or 'as above' referring to the previous question on legislation and policy	11 (30.6)
	Consultation with playground companies, colleagues, members of the community, and play champions	8 (22.2)
	Standards	3 (8.3)
	Building regulations	2 (5.6)
	Policies	1 (2.8)
	Not applicable	4 (11.1)
	None listed	7 (19.4)

Chapter Seven: Study V, Paper V

Moore, A., Lynch, H., & Boyle, B. (*In preparation for publication*). Playground usability: A multi-stage qualitative descriptive study exploring the perspectives of playground users.

The first (Study I, Paper I) and second (Study II, Paper II) scoping review studies identified a need to strengthen the evidence base for using Universal Design (UD) for public playground design. Moreover, the third scoping review study (Study III, Paper III) asserted that further research with public playground "user experts" was required if UD is to realise its potential as a medium for social justice in playground design for inclusion. Therefore, responding to the overall aim of this thesis, and informed by emergent findings from the third scoping review study that established the need for further research with "user experts", this qualitative descriptive study (**Study V, Paper V**) focused on examining social participation of playground users in current playgrounds, to inform good practice in UD.

With supervision and guidance from her supervisory team (Dr Helen Lynch and Dr Bryan Boyle), the research design, data collection, and data analysis were conducted by the PhD candidate. The PhD candidate wrote this paper with supervisory support and mentorship from her supervisory team. The study is presented here as a draft manuscript that is in preparation for publication. Future efforts will pertain to reflecting and discussing on the strengths and added value this study adds, and how to illuminate that prior to submitting to a journal.

As before, there is some overlap with the previous sections of this thesis. The figures and tables are presented at the end of the chapter.

Title

Playground usability: A multi-stage qualitative descriptive study exploring the perspectives of playground users

Abstract

Public playgrounds are important built environments for outdoor play, social participation, and inclusion. However, many children and their families experience playgrounds as sites of spatial and social exclusion. Consequently, Universal Design (UD) is being promoted in the international context for the design of public playgrounds that support outdoor play, social participation, and inclusion; however, there is a lack of research evidence concerning its applicability. Therefore, the aim of this study was to gain an understanding of family's experiences of using and/or not using playgrounds by exploring the perspectives of children and adults, through the lens of play and play value to inform UD. A multi-stage qualitative descriptive design was employed. Nine children and five adults that were recruited via purposive and convenience sampling techniques. Data were collected using surveys, creative exercises, and semi-structured interviews, and data were analysed using descriptive qualitative content analysis. The analysis process resulted in four overarching themes: can I get there, can I play there, can I stay there, and our dream playground. In sum, results revealed that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants confirmed that diverse factors require consideration to ensure that play spaces offer varied play experiences and facilities for all and consequently offered many creative ideas to improve the usability of playgrounds. In this way, participants identified potentially practical ways of implementing UD in playground design for inclusion. Therefore, for UD to fully realise its potential in underpinning the design of public playground for inclusion, it is essential that public playgrounds are co-designed and co-created with user experts and professional experts.

Keywords

play; playground; playground experience; usability; inclusion; universal design

Introduction

Although there are many cultural variations and differing attitudes towards play, all children play (Moore & Lynch, 2018; Roopnarine, 2011). Different academic disciplines provide many understandings of what play is, what it can do for individual children and society, and equally, what play deprivation can mean for children, families, and society (Woolley, 2013). For this paper, play is defined as a subjective experience characterized as active, freely chosen, process rather than outcome-oriented and intrinsically motivating (Bundy, 1997); otherwise referred to as play for the sake of play (Lynch & Moore, 2016). Although play has a universally accepted role in contributing to all children's wellbeing and development (Ginsburg et al., 2007; Milteer et al., 2012), the role of outdoor play in contributing to children's wellbeing and development is receiving increased attention (Committee on the Rights of the Child [CRC], 2013; Moore & Lynch, 2018; Tremblay et al., 2015). Outdoor play is characterised as less supervised, less structured, more adventurous and comprises elements of challenge and risk. It is seen to confer a range of social, emotional, cognitive, and physical benefits for children (Alexander et al., 2012; Bates & Stone, 2015; Brussoni et al., 2015; Gill, 2007; Herrington & Nicholls, 2007; Sandseter, 2009; Sandseter & Kennair, 2011; Stephenson, 2003; Tremblay et al., 2015; Wen et al., 2009).

Despite these apparent benefits, participation in outdoor play is under threat in many contexts around the world. Indeed, there is considerable evidence that children's outdoor play opportunities have steadily declined across the past several generations particularly in the global north (Clements, 2004; Dodd et al., 2021; Gray, 2011; Hofferth, 2009; Hofferth & Sandberg, 2001a, 2001b; Horton, 2017; Karsten, 2005; Lee et al., 2021; Loebach et al., 2021; Shaw et al., 2013; Skår & Krogh, 2009; Tremblay et al., 2015; Valentine & McKendrck, 1997; Veitch et al., 2006; Witten et al., 2013). For example, there is evidence to suggest that children today play less outside that their parents did and that their play has become more and more structured and occurs indoors (Bassett et al., 2015; Hofferth, 2009; Hofferth & Sandberg, 2001a, 2001b; Skår & Krogh, 2009; Valentine & McKendrck, 1997; Veitch et al., 2006). While there are potentially multiple layers of influence on diminishing outdoor play opportunities (Lee et al., 2021), researchers have attributed a range of ongoing societal shifts, as contributing factors. These include, for example: urbanisation,

neighbourhood social and environmental conditions, technological advancements, children's safety and parental concerns, lifestyle changes, children's perceptions of outdoor play, and changing social norms around children's independent mobility (Brussoni et al., 2012; Carver et al., 2008; Kyttä et al., 2015; Loebach et al., 2021; Schoeppe et al., 2016; Shaw et al., 2015; Singer et al., 2009; Tremblay et al., 2015; Valentine & McKendrck, 1997; York et al., 2003).

Nevertheless, Kemple and colleagues (2016) asserted that decreasing time spent in outdoor play should "concern us beyond a simply nostalgic lamentation of a bygone time" because outdoor play provides children with important benefits and developmental experiences that cannot easily or readily be provided, if at all, through other means (p. 448). Indeed, reductions in play opportunities have been documented internationally with researchers coining terms such as 'play deprivation' (Bundy et al., 2011), 'poverty of experience' (Welsh Government, 2014), and 'nature-deficit disorder' (Louv, 2008). Overall, these trends are said to constitute a generation of 'play-malnourished', 'battery-reared', 'bubble-wrapped', 'chauffeured', 'couch kids' (Cole, 2005; Gill, 2004; Romero, 2010; Voce, 2015; Wheway, 2007). Moreover, a cross-sectoral group of partners, stakeholders, and researchers, when they collaborated to develop an evidence-informed *Position Statement* on active outdoor play unequivocally asserted that the "drift from time spent outdoors to increased time spent indoors has occurred concurrent with the childhood obesity and inactivity crisis, and parental expectations surrounding child protection" (Tremblay et al., 2015, p. 6477).

Therefore, considering the myriad of benefits attributed to outdoor play, it is not surprising that children's geographers and urban scholars have continually emphasised the urgency for creating opportunities for children to play outdoors, especially in urban contexts (Chawla, 2002; Freeman & Tranter, 2012; Gill, 2021; Karsten, 2015; Nikku & Pokhrel, 2013; Skelton, 2012; Valentine & McKendrck, 1997; Wright et al., 2019). Specifically, policymakers, practitioners and communities are working together in many contexts around the globe to deliver better play opportunities in urban locations (Brown et al., 2019). For example, in 2014, Wales was the first country to legislate for play, placing a statutory duty on local authorities to ensure sufficient play opportunities for all children in their area (Welsh Government, 2014). Other international initiatives include, for example, Urban95 (Vincelot, 2019) which invites

adults to reimagine cities from 95 cm, the average height of a healthy 3-year-old, Arup (Arup, 2017) 'Cities Alive: Designing for urban childhoods' which highlights critical arguments for a child-friendly approach to planning and design for urban environments. More recently, the Real Play Coalition developed the Urban Play Framework which provides a method to understand how various urban systems impact a child's learning through play experience (Arup & The Lego Foundation, 2020). In addition to initiatives focusing on infrastructure for children's play in the public realm, some researchers have focused their attention on specific spaces for children's play also.

The term 'play space' is a "transferable and loose notion that can be applied to any environment in which a child chooses to play" (Woolley & Lowe, 2013, p. 54). The provision of outdoor play spaces for children can take many forms in the built environment (Kilkelly et al., 2016; Woolley, 2013), however, for the purpose of this paper, the focus is on public playgrounds. Public playgrounds (referred to hereafter as playgrounds) are built environments that have been specifically designed and designated as a place in which children can play outdoors (Casey, 2017; Woolley & Lowe, 2013). Playgrounds are regarded as important environments for outdoor play and social inclusion in many contexts around the world (Lynch et al., 2020; Lynch et al., 2018; Moore, Boyle, et al., 2022a, 2022b; Moore & Lynch, 2015; Moore, Lynch, et al., 2022a, 2022b; Nabors et al., 2001; Rigby & Gaik, 2007; Talay et al., 2010). They are generally located in a neighbourhood or at a location that families travel to away from where they typically live, work or access education to utilise the play space (Daniels & Johnson, 2009), and typically include equipment and structures that are purpose-designed and built for children (Brown et al., 2021; Burke, 2013; Moore et al., 2022a). They facilitate unstructured play (Brown et al., 2021; Elkind, 2007; Frost et al., 2004) and afford children opportunities to develop different skills, learn social norms and values, take risks, test their limits, and provide potentially meaningful opportunities for social interaction (Bennet et al., 2012; Fjørtoft, 2001; Moore & Cosco, 2010; Olsen & Dieser, 2012; Siu et al., 2017; Turner et al., 2009).

By their nature, playgrounds are typically organised spaces that offer children a range of opportunities to play, however the organised nature of such spaces may not adequately accommodate the diverse range of children's abilities, interests and

preferences that are associated with inclusion (Moore, Lynch, et al., 2022a; Stafford, 2017). Consequently, many children are not afforded opportunities to benefit from participating in playgrounds on an equal basis to other children due to tensions between children's play needs and the formal, managed, play environments typically designed and planned by adults (Stafford, 2017). Specifically, researchers have identified significant barriers that result in social and spatial exclusion for many; these include, for example: poor design (Lynch et al., 2019, 2020; Moore & Lynch, 2015; Moore, Lynch, et al., 2022a; Olsen & Dieser, 2012; Prellwitz & Skär, 2007), a lack of knowledge among playground providers about diverse users and designing for inclusion (Moore, Lynch, et al., 2022b; Prellwitz & Tamm, 1999; Sterman et al., 2019; Wenger et al., 2022), and a lack of play policy internationally and a subsequent lack of accountability for the provision of inclusive playgrounds (Lynch, 2022; Lynch et al., 2018; Van Melik & Althuizen, 2022). Therefore, despite the established benefits, playgrounds represent an environment of social and spatial exclusion for many, because of physical barriers to access and social barriers to participation (Brown et al., 2021; Lynch et al., 2019, 2020; Moore & Lynch, 2015; Moore et al., 2022a; Perry et al., 2018; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Stafford, 2017; Talay et al., 2010).

While decreased opportunities apply to many children, it is potentially amplified for children with disabilities and their families because of additional factors including attitudinal, physical, and social barriers resulting in reduced opportunities to benefit from participating in play compared with other children (Anaby et al., 2013; Moore et al., 2022a; Schreuer et al., 2014; Sterman et al., 2016; van Engelen et al., 2021). Still, the right to play and access the physical environments (including play environments) is enshrined in the United Nations (UN) Convention on the Rights of the Child (UNCRC) (UN, 1989) and further endorsed in the UN Convention on the Rights of Persons with Disabilities (UNCRPD) (UN, 2006). Most State parties across the world, including Ireland, have ratified these Conventions, and thus, have committed to upholding these rights. However, problems in implementing these rights led to the publications of General Comment No. 17 (GC 17) on play and leisure (CRC, 2013), and CRPD/C/GC/2 General Comment No. 2 (GC 2) on accessibility (Committee on the Rights of Persons with Disabilities [CRPD], 2014), to clarify duties of State parties with respect to human rights treaty provisions. Both General Comments endorse

Universal Design (UD) at a conceptual or theoretical level for designing environments that are accessible, usable, and inclusive of all. Subsequently, there has been increased attention given to inclusive playground provision, to address the barriers that children and their families experience in playgrounds (Lynch et al., 2020; Moore et al., 2022a; Stafford, 2017) and reframe playground design as "the architecture of social participation" (Lynch et al., 2018; Steinfeld & Maisel, 2012).

Subsequently, play researchers internationally have promoted the use of UD as a specific design approach for designing playgrounds that are inclusive for all (Burke, 2013; Lynch et al., 2019, 2020; Lynch et al., 2018; Prellwitz & Skär, 2007; Woolley, 2013). Yet, it has been concluded elsewhere that the application of UD is challenging when considering the need to design for play (Casey, 2017; Lynch et al., 2018). Nevertheless, researchers have recently asserted that UD needs to be tailored to include play and play value as a central concern (Lynch et al., 2020; Lynch et al., 2018; Moore, Boyle, et al., 2022a, 2022b; Moore, Lynch, et al., 2022a, 2022b), if UD is to realise its potential as a medium for social justice in playground design for inclusion. Moreover, they have identified that when considering a UD approach for playground design, it is essential to begin with a user's perspective (Moore et al., 2022a; Prellwitz & Lynch, 2018). Therefore, for this paper, the focus is on examining social participation of playground users in current playgrounds, to inform good practice in UD.

While some efforts have been made in recent years to explore user perspectives in the context of playground design for inclusion (Bhuyan, 2022; Black & Ollerton, 2022; Hill & Chawla, 2019; Lynch et al., 2019, 2020; Olsen & Dieser, 2012; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016; Ripat & Becker, 2012; Stanton-Chapman & Schmidt, 2016, 2017, 2018, 2019; Sterman et al., 2019; Wenger et al., 2021), few efforts had been made to understand the experience of playground use from diverse user perspectives. Additionally, a recent scoping review study revealed research efforts to date have relied on the accounts of adult caregivers as a proxy for exploring children's (particularly those with disabilities) perspectives on playgrounds (Moore, Lynch, et al., 2022a). Yet, for some time now, researchers have criticised playgrounds for being static, boring, and not concerning to the needs and preferences of children (Hart, 2002; Holme & Massie, 1970; Moore, 1989; Wardle, 1990; Woolley, 2008).

Therefore, it is not surprising that researchers have stressed the need for children's perspectives in the context of outdoor play and playgrounds (Brown et al., 2021; Moore, Boyle, et al., 2022a, 2022b; Moore, Lynch, et al., 2022a, 2022b; Parker & Al-Maiyah, 2022; Wenger et al., 2021).

Thus, to respond to these knowledge gaps, the purpose of this study was to add to our understanding of the experience of playground use by investigating the experiences of playground users. The primary aim of this study was to explore the experiences using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD. Secondary aims were to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts, by exploring what an ideal (dream) playground would look like. Ethical approval to conduct this study was granted by [Blinded for review] in October 2021, and the study was conducted in the Republic of Ireland between February and April 2022.

Methods

Study design

As this study aimed to gain an in-depth understanding of children and adults' experiences of using and/or not using playgrounds, a qualitative descriptive research design was chosen. Specifically, a 3-stage qualitative descriptive research design was employed consisting of pre-interview online surveys, a creative exercise to design their dream (ideal) playground, and semi-structured interviews. This design was deemed most suited as it is particularly relevant for exploring phenomena that are not well understood and enables the acquirement of comprehensive insights from the perspectives of those who have experienced the phenomena first-hand (Kim et al., 2017; Sandelowski, 2000, 2010). Moreover, the use of multiple qualitative methods meant that between-method triangulation, combining contrasting methods (i.e., online survey, creative exercise, and semi-structured interviews) were used to compensate for the limitations of one approach with the strengths of another (Amin et al., 2020; Bryman, 2016).

Study setting

Ireland is a country consisting of thirty-two counties across two states – Northern Ireland and the Republic of Ireland. The Republic of Ireland occupies twenty-six of the thirty-two counties, divided over four provinces – Munster, Leinster, Connacht, and Ulster.

Participants and eligibility

Purposive and convenience sampling techniques were used to recruit family units (referred to hereafter as families) that use and/or do not use playgrounds. The eligibility criteria in the selection of participants were identified as follows; families needed to: (a) consist of a minimum of one adult (parent/ legal guardian) and one child (aged 0 – 18 years), (b) provide active consent (adult participants) and assent (child participants), and (c) be able to participate in all three stages of data collection.

In all instances, potential participants were contacted by one of three gatekeepers (Table 1) who offered information on what the study was about and who was conducting it. If potential participants were happy to be contacted by the first author, the gatekeeper forwarded their email contact details for the first author to make contact. Once the first author made initial contact with potential participants, the first author provided potential participants with information about the study, including a request for their participation, whereupon those who agreed to participate returned a letter of informed consent (adult participants for their own participation and the participation of their children) and assent (child participants) to the first author prior to data collection.

A combined five families, including five adult and nine child participants, residing in urban, suburban, and rural locations across three provinces (Leinster, Munster, and Connacht) in the Republic of Ireland consented and assented to participate in the study. The adult participants comprised of four mothers and one father, while the child participants included five girls and four boys aged between three and thirteen years (Table 2); all participants were playground users.

Data generation

The views and experiences of children and adults were obtained using three stages of data generation between February and April 2022, to explore their experiences of using playgrounds, and to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts. The stages are described below. It was originally anticipated that in-person data collection would take place with families; however, the COVID-19 pandemic posed an unprecedented challenge for in-person data collection and fieldwork, and thus, an online format was deemed more appropriate.

Stage one: Pre-interview online surveys

Stage one involved a pre-interview online survey with child and adult participants. Two bespoke questionnaires, one for child participants and one of adult participants, were designed to capture children and adults' experiences of using (accessing and participating) or not using (reasons for non-use) playgrounds. Prior to data collection, the draft questionnaires were piloted with one adult and five children, to test for clarity and possible operational errors. Feedback from the pilot exercise meant that the questionnaire for children was simplified (i.e., text simplification).

The final questionnaires (described in Table 3) were hosted on Google Forms to capture the required information and links to the surveys were distributed to participants who agreed to participate, once their letters of informed consent and assent were returned via email to the first author. In sum, five adult participants completed the adults survey, and nine child participants completed the children's survey. The surveys were not anonymous; participants included their names in the survey, so that data could be matched to participants across all three stages of data collection and follow-up questions could be asked at stage three of data collection (semi-structured interviews).

Stage two: Creative artistic approaches

Stage two consisted of a creative exercise to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts. Specifically, participants were invited to design their dream playground, through a medium of their

choice (e.g., arts and crafts, drawings, written compositions, technology), at a time that was convenient to them.

The first author requested participants to send pictures of their creations to her via email in advance of stage three of data collection. Overall, six drawings and one 3D artwork creation were produced by the participants.

Stage three: Semi-structured interviews

Stage three of data collection consisted of semi-structured online interviews with families to feedback on their experiences of participating in stages one and two of data collection. Prior to data collection, the draft semi-structured interview guide was piloted with five children, to ensure that the questions were fit for purpose. Feedback from the pilot exercise meant that the draft guide was simplified (text simplification) and further questions were added to elicit pertinent information regarding playground use and non-use. Furthermore, the first author reviewed online survey responses and photographs of creations from stages one and two of data collection in advance of the interviews, to formulate a tailored semi-structured interview guide for each family.

Thus, a semi-structured interview was used in each of the interviews; the first author sought clarification where required (from stage one) and families were asked to discuss their dream playground (from stage two) to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts. These online interviews were hosted by the first author on MS Teams. Overall, thirteen participants participated in the online semi-structured interviews (five interviews in total with five family's); one child chose not to participate in this stage of data collection as he was "shy" (reported by mother). In total, 204.59 minutes of interviews were recorded; the length of interviews ranged from 29.27 minutes to 58.41 minutes, with the average duration being 40.92 minutes.

These online interviews were also recorded on MS Teams, and the MS Teams dictate tool was used. Additionally, all interviews were digitally audio-recorded in case of any data losses, and the first author captured field notes after each interview to document contextual information and additional ideas. The first author checked all transcripts generated by the MS Teams dictate tool, and amendments were made as

required to ensure that the interviews were transcribed verbatim. All personal identifiers were removed to maintain participants' confidentiality.

Data analysis

For data analysis qualitative content analysis was chosen to condense extensive and diverse raw data, to explore and interpret the data, and to determine links between the research objectives and the data interpretation (Elo et al., 2014; Elo & Kyngäs, 2008). Qualitative content analysis is a research method for describing and interpreting textual data through the systematic process of coding (Assarroudi et al., 2018). Arising from this process is the identification of categories, themes, and patterns (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). While qualitative content analysis is frequently data oriented, the analysis can also be guided by a certain theory or concept (Schreier, 2012); therefore, a framework developed by colleagues in New South Wales, that is Can I get there? Can I play? Can I Stay? (New South Wales [NSW] Government, 2019), was adopted in the content analysis.

Specifically, data were integrated to offer a more complete picture of children and adults' experiences of using playgrounds, and to generate ideas that would improve the inclusivity of playgrounds in future development and provision efforts. The first author began the preparation phase by familiarising themselves with the data through repeated rereading. Next, line-by-line open coding was undertaken on all qualitative responses, and data-drivel labels, informed by the underpinning framework, were applied to groups of words or sentences to summarise their meaning. Following the coding of all data, the first author grouped codes with similar meanings into categories, and the process of abstraction occurred until all identified categories were deemed appropriate to adequately describe the data. Overall, data analysis was led by the first author and confirmed by the remaining authors.

Results

Analysis of survey responses, creative artefacts and interviews revealed key factors that dominated the families' experiences of using playgrounds. As noted, data from all three stages was combined to offer a more complete picture; therefore, corresponding with the framework used to guide the content analysis, the results were grouped around three central headings, they are: Can I get there? Can I/ they play

there? and Can I stay there? In addition, ideas for dream playgrounds are presented under the heading, our dream playground. The findings are presented below with some quotes to illuminate the points being made.

Can I get there?

Can I get there pertained to location, layout, and barriers to getting there.

Location

All participants described local playgrounds to where they reside. Three families living in urban and suburban locations noted that they could walk, scoot, cycle, and/or rollerblade to their local playgrounds (Families 2, 3, and 5); however, one child noted:

> "Sometimes we walk and sometimes we drive" (Harry)

Nevertheless, two families living in suburban and rural locations noted that they travel to playgrounds by car (Families 1 and 4). Families also identified that while they travel to playgrounds (primarily large destination playgrounds), they primarily use the local playgrounds. Reasons for visiting local playgrounds included the playground being nearby, being local to the area, the availability of facilities such as parking, and:

> "… two-minute drive … [child's father] is local here, so he knows everyone … if you're in the city … you won't know who is in the playground" (Anna)
>
> "It's near us … location, parking …" (Rose)

When asked whether they would travel to playgrounds, most families noted that although playgrounds are well liked among the children, they would not necessarily travel outside of their locality to use playgrounds:

> "… we don't necessarily go out of our way to go to a playground …" (Katie)
>
> "… I … wouldn't go up to [the] park specifically to go to the playground" (Hannah)

However, there were some exceptions, for example, if they were meeting friends or if they were on holidays in different locations:

> "[meeting friends]… suits us … halfway for both of us …" (Anna)
>
> "If we're ever anywhere on holidays anywhere, if there's a playground, we'd always go in to have a look and check it out …" (Rose)

For one family, however, their favourite playground required a designated car journey. They reported:

"… we're passing … thirty playgrounds … we just really like … that there is a skateboard park …" (Oliver)

In terms of who they visit with, younger child participants reported that typically visited playgrounds with their adult caregivers:

"Daddy" (Poppy)

However, for the older children, they noted that they go to the local playgrounds:

"… alone for walks …" (Noah)

The parents confirmed this also, reporting:

"… at this stage … they go on their own" (Emily)

Still, one parent acknowledged that they supervise some journeys to playgrounds because of main roads:

"… 10 minutes' walk away across a few main roads … supervise a journey there" (Oliver)

Layout

Participants spoke about layout of playgrounds for different reasons. Child participants discussed layout as it pertained to the groupings of items and spaces for younger and older children. One child identified that they would combine age groups so that it does not feel separate:

"… sometimes like playgrounds are separated into … small kids … [and] big kids [areas] … if we … combined it. Otherwise … it might feel … separated" (Lucy)

Lucy's sibling offered an explanation as to why they thought playgrounds were separated based on age:

"… the reason … is … the older kids [are] … more confident … running around … won't really realise that there are like little kids as well" (Hannah)

Even so, Lucy identified that segregating playgrounds based on age, might exclude some children, and restrict friendships:

"… for both ages … otherwise it kind of seems a bit [excluding] … older kids and smaller kids can be friends… and it would kind of be just restricted" (Lucy)

Nevertheless, one child identified that age groups should not be mixed, because younger children might get hurt:

> "I don't really think that like a 6-year-old and a 12-year-old [should be] playing on same thing … [as] younger people can get hurt … (Noah)

Still, the same child acknowledged, that it depends on who is playing:

> "Really depends on like who is playing with them" (Noah)

However, adult participants spoke about the layout of playgrounds for different reasons. One adult identified that they liked a park because there are three places to play, within proximity to each other:

> "The park is large with two playgrounds and a skateboard park located quite close to each other" (Oliver)

Another adult identified that they liked a playground because it's big enough for children to run around, but small enough to make supervision easier from a standing viewpoint:

> "… it's big enough that they can run around … but small enough that they can't get lost and there's a fence around it … it's just well laid out … can see everything from … standing …" (Anna)

The same adult reported that they like when a playground is enclosed with a fence and gate, and separated based on age:

> "… you wouldn't be as nervous of them … if there is a fence and a little gate … I like when they are secure with a railing or if there is a younger and older kids section separated …" (Anna)

Another adult also determined that they like when there is space and items are spread out and the space is enclosed:

> "… where there is more space and where things are more spread [out] … I'm much more at ease … an enclosed space" (Katie)

Barriers to getting there

Barriers to getting there meant that some participants were not able to get to some items and spaces, meaning that their play was subsequently restricted. Although most families did not identify barriers, one family experienced barriers to getting there. When discussing their favourite playground, one adult noted that their child who uses a wheelchair cannot use certain items or spaces in playgrounds:

> "[Cannot get] into the tower" because it requires "climbing" and is located "up high" (Rose)

With reference to two further playgrounds, the same adult identified barriers to getting there as they pertain to surfacing, and the most fun parts being located up high:

> "… the woodchip is a big challenge … the most fun parts … [require] climbing" (Rose)
>
> "… you have sand … managing it with wheels is a bit of a challenge" (Rose)

They further noted that:

> "… the surface obviously is key" (Rose)

Still, the same adult identified that, as a family, they are currently able to overcome many barriers via lifting. However, they noted that if they did not have their older children with them, of if their child that uses a wheelchair was bigger, then it would be a bigger challenge:

> "… a lot of stuff we can kind of work our way around like swings and things like that, see saws" (Rose)
>
> "[My older children and I] … circumvent a lot of the issues by lifting … if I didn't have the bigger two with me, or if Alfie was bigger … it would be a bigger challenge" (Rose)

Nevertheless, and despite the barriers, the same adult spoke of the importance of being in a playground, even if her child is not able to access and use everything:

> "Just being in a playground, … like there's a lot of things that he can't go on, he still … just like to be there … it's the shared experience … hanging out and seeing everyone … he just loves the atmosphere" (Rose)

Additionally, the same adult noted that although climbing items are not accessible for her child that uses a wheelchair, they are nonetheless important for her older children:

> "Climbing isn't compatible like for a lot of people … [however] they love being able to climb and explore … climbing is a huge part" (Rose)

Furthermore, other participants spoke about not being able to use certain items or spaces in playgrounds. For example, one child spoke about another child not being able to use an item because of height limits:

> "… you had to be like a certain height to get into it … she was just over, like the [height] limit" (Noah)

The same child also spoke about the scale of a climbing item, and not being able to use it themselves because it was too small:

> "… people that fitted the size of the climbing frame were using it … I really wanted to, but I was too big for it …" (Noah)

Also, one child spoke about not being able to use certain climbing items because it's too difficult:

> "… dome … you can climb into it … I try to get to the top and then drop in, but it's too hard" (Harry)

On the other hand, adult participants identified other reasons that resulted in their child(ren) not being able to use certain items or spaces in playgrounds. One adult spoke about the scale of items, and their younger daughter not being able to use the steps because they were too big:

> "… the steps are so big, she [younger child] can't get up … if they even had … ramps with the things to put hands in … or a smaller version. Just a smaller version of everything would be great" (Anna)

The same adult noted that a child with a disability could get into their local playground, but identified that there is not much for them to do:

> "… [there's a tarmacadam] footpath … so, … if there was anyone in a wheelchair they could go round the full playground and see, but … there won't be a whole lot for them to do depending on the disability …" (Anna)

To summarise, can I get there addressed the location, layout, and barriers to getting there that promote and hinder playground use.

Can I/ they play there?

Can I/ they play there pertained to participants experiences of using their favourite playground, other playgrounds, as well as considerations for playground users.

Favourite playground

Participants were asked to identify their favourite playground and determine why it is their favourite to use. Child participants primarily focused on the items and spaces available. Items included:

> "Zipline, swings, obstacle course … roundabout" (Alfie)
>
> "Good obstacle course … slide …cool to get up it… sand machine…" (Harry)
>
> "… climbing frame … slide … sand" (Jacob)

"Swing, slides" (Poppy)

"… zip line" (Lucy)

"… big climbing frame" (Noah)

"I like to scoot/rollerblade up and down the ramps [in the skateboard park] because they're not too big ramps and not too small" (Amy)

However, although some items were their favourite, one child spoke about an item being broken:

"… sand machine … doesn't work anymore … probably little kids have been clogging it up with other sand" (Harry)

Some children also spoke about the spaces available for play, as well as the features within these spaces that allowed from scooting and rollerblading, for example:

There is a skateboard park and two playgrounds, and it is a big park and there is lots of wind turbines (Molly)

"Because it has a lot of fun benches to climb on and it has two playgrounds and an open skateboard park … playing fields … a pitch … a tennis court" (Amy)

"I like going on my scooter … on the skateboard [park], … going down the ramps … I like rollerblading as well … the path between like the all the different playgrounds are really smooth, so you could like scoot up and down them on …" (Molly)

Additionally, some children spoke about options being available in their favourite playground, that afforded opportunities for challenge:

"… what I really like about the skate park is there's only like two really challenging ramps … there's some smaller ones, but the ramps are all like medium sized …" (Amy)

Also, some children spoke about the social aspect of playgrounds and being able to meet and play with friends and/or siblings in their favourite playgrounds:

"Meet friends … play chasing…" (Alfie)

"Sometimes we bring our friends, and everyone brings their scooters" (Molly)

"Play obstacle course games with Jacob … pick a spot in the maze … see who's the first person to get to the middle …" (Harry)

When asked to identify what their children like to do in their favourite playground, some adults confirmed what their children had described, and elaborated in some instances:

> "Hang out with friends, play" (Rose)
>
> "Use scooters and inline skates in the skateboard park … use the climbing frames and the multi-person tyre swings … jumping from bench to bench … Molly also likes the drama and slight sense of danger when the wind turbines are moving" (Oliver)
>
> "…train with different compartments, so sometimes she might hop in and pretend … the little tractor [rocker] … she likes to sit in and just bop away" (Anna)

When asked what they themselves like to do in their favourite playground, adult participants reported that they like to:

> "Hang out with friends, go for a walk" (Rose)
>
> "Supervise the kids, video, or photograph them, and push them in the multi-person tyre swings" (Oliver)

Moreover, when asked what they like about the playground in general, one adult noted that they like that there's not that many children, there's good variation, and their child knows what they are able to do:

> "…there's not that many [children] … good variation …[Poppy] knows what she's able to do …" (Anna)

Also, one adult identified that they like how the park is dramatic and designed as a bigger concept, which could naturally bring groups together:

> "… the architecture of the park is quite dramatic … it's quite modern, it's quite Dutch … not just a … big field designed to suit a tractor mower. And in the middle of it, or in the corner of it, they dump a playground … the whole thing is … a bigger concept …" (Oliver)

They also noted that it is nice to be able to use the park beyond the playground, and how its design could bring groups together:

> "… it's nice to play beyond … the designated playground areas … … it could naturally bring together different types of groups … [which] begins to make it more, you know, natural, and integrated, and richer" (Oliver)

When asked whether they would change anything about their favourite playgrounds, some child participants identified that they would not change anything. However, one child spoke about making items longer and higher, as well as incorporating a pizza oven:

> "The zipline …. make it … longer … the slide … [make it] as tall as the Eiffel Tower … add a pizza oven" (Alfie)

Another child identified that in addition to bigger and higher items, they would incorporate items that had multiple uses, with play leading from one item to the next:

> "… If lots of things were connected and there were higher things with like climbing walls going up … I would put in a big tower with slides and climbing frames coming off it and leading up to it and a few more swings … a lot of slides as well" (Amy)

The same child also highlighted the need to cater for different play preferences:

> "… should be like lots of different stuff. So, if somebody really likes monkey bars, there should be monkey bars" (Amy)

Also, one child identified that their favourite playground did not have standard swings, and thus, determined that they would incorporate these as well as other items:

> "…there weren't any proper swings, so I might put some proper swings … loads of tyre swings … climbing frame …" (Molly)

Moreover, adult participants also identified changes for their favourite playgrounds. One adult spoke about including more accessible facilities, and additional seating:

> "More accessible facilities, more seating" (Rose)

Also, an adult identified that the current spaces could be expanded to allow for more varied use:

> "The skateboard area … could better facilitate other users of wheeled toys, such as bikes, inline skates, and scooters …" (Oliver)

Similarly, another adult discussed how unused space could be utilised to incorporate additional play opportunities, which would subsequently support their own integration in the community via volunteering efforts:

> "… space there beside the playground if they put in a basketball court … to have something else even to run around on … [I would volunteer for coaching] so, that'd get me involved and get me more into the community as well" (Anna)

Other playgrounds

In addition to their favourite playgrounds, participants were asked to identify what they like about other playgrounds. Children identified numerous items and spaces that they like in other playgrounds. Some children spoke about larger swinging, climbing, or sliding items:

> "… big swings or climbing frames …" (Hannah)
>
> " … I like big climbing frames …" (Lucy)
>
> "…climbing things … for older kids" (Amy)
>
> "… big slides … I like seeing this really like big things to go on that just makes it look more fun" (Noah)

Some children also spoke about items for spinning, climbing, jumping, swinging, and scooting or rollerblading:

> "… small spinning thing … looks like you're going really fast, but you're actually going really slow … there's also this … tiny dome where it has bars, and you can climb into it …" (Harry)
>
> "… I really look for is something to climb on …" (Molly)
>
> "…really good monkey bars which are just the right distance apart …" (Amy)
>
> "… plastic hoops and you, like, jump from one to one … pot things that like spin around …" (Noah)
>
> "…a pole and then there's like a ring around it with bars coming up and you can … swing about or you can hoist yourself up onto the bars … [and] someone pushes us …" (Amy)

In addition to items for sliding, one child identified that they like items they can manipulate:

> "… twirly slides … and the mechanical things … the little diggers" (Hannah)

The same child spoke about items for making sound:

> "… the wind chime, things with the block, with the things … there was also these things that when you bounce on, it's a different note …" (Hannah)

Also, children identified that they like obstacle courses and fitness items:

> "… obstacle courses …" (Lucy)
>
> "… fitness things …" (Noah)

In addition to items and spaces, some children discussed broader reasons as to why they like certain playgrounds. For example, one child identified that although a playground is for younger children, the park in which the playground is located is nice:

> "… the park is really nice … the playground is … for younger children" (Noah)

Additionally, one child identified that the provision of items and spaces for younger and older children, as well as items for both age groups make it fun:

> "… [there's] smaller bits that like younger kids … might want to go on. But then there's also like the tall bits … for older kids. So, it's like a mix … there's like a swing … it's really fun because like both ages can go on it …" (Lucy)

Another child also identified different options for using an item, for different levels of challenge:

> "…big kind of rocket tower and up the tower they have … rock climbing walls but it has bars either side. So, you can climb up without the bars, but then you can also choose the bar option as well" (Amy)

Additionally, one child spoke about playgrounds that incorporate things that are good for the environment:

> "… things that are good for the environment … that's important too … they don't use like big plastic things" (Lucy)

The same child spoke about playgrounds being a space for families, and the location of playgrounds within parks:

> "… what I do like about playgrounds is that it's just a place for the family… I think also a park is very important … because … with a playground comes a park" (Lucy)

They also determined that something that looks different and has lots of items makes a playground good and fair:

> "…what makes a playground good, is … something that's different, that looks like different … if it had … loads of different like bits and bobs … and for both ages … I think it would just be more kind of fair … (Lucy)

Moreover, child participants were asked to identify the scariest/ riskiest thing they had ever done in playgrounds. Some children spoke about items that afford opportunities for climbing and hanging:

> "… you can climb up it … it's very it's very dangerous because there's ropes that that you have to stand on … [also,] monkey bars …" (Harry)

"Monkey bars are fun" (Lucy)

"I used to hang off fireman poles" (Noah)

Other children identified that they use items in ways that they are not typically intended for use:

"Walking on top of monkey bars " (Hannah)

"… and even if something is not used for climbing, I like climbing on top of it" (Molly)

Also, one child spoke about trying challenging things that result in accomplishment later:

"… if more people do … stuff that they're scared of, like the easier it'll get … because I used to not be able to go down … a pole. But I did in the end" (Lucy)

Following up on discussions with children that spoke about challenge, one child spoke about the necessity of challenge in playgrounds to avoid boredom:

"… good to have things that are challenging because … they can just get boring … younger children … should be … equally challenging and fun … you can have fun doing something more challenging stuff" (Lucy)

Another child spoke about doing lots of fun things, but not too much:

"I do lots of really fun things … but maybe not too much because that might be too much" (Alfie)

Also, one child was asked whether they feel that the playground should be more challenging for older children; they replied:

"Yeah, but like the option to be challenging and the option to be not" (Amy)

Furthermore, adult participants were also asked to identify what they like about other playgrounds. One adult identified that they value green space alongside a playground, as they do not have a back garden:

"… our ideal is when there's plenty of green space alongside a playground … we [value] the availability of green space … [we] don't have a back garden …" (Katie)

Additionally, an adult identified that they like when play items are made from natural materials:

"… chambers created by weaving live willow … it's lovely when you see fun things made of quite organic things …" (Oliver)

Also, an adult with older children identified that they like fitness items alongside playgrounds, as all the family can use these. Still, they noted that they could be further developed to make them more fun for families:

> "…fitness stations … close to playgrounds and they're really fun … and that's something that the whole family can do … there is scope to develop them as more fun and the family have playing and working out together" (Emily)

Additionally, another adult spoke about the availability of refreshments and being able to sit and watch their children:

> "… in the summer … they have … an ice cream van and they do like coffees and stuff which is great … if they're [referring to children] playing, we can sit down and watch them and have a coffee" (Anna)

The same adult also identified that they like playgrounds with rubber surfacing for running, and avoiding mud after bad weather:

> "… sponge padding … on the ground and that's great … so they can run … or even after it's been raining, and it doesn't matter as much because the other … [playground] has mud" (Anna)

When I can't play there

On the contrary, participants were asked to identify what they do not like about playgrounds. One child spoke about playgrounds being fun, but not exciting; they also referred to the lack of connection or flow between play items:

> "I think the playgrounds aren't very exciting … they are fun. But they aren't that exciting. Like they don't have lots of … like things [that] connect …" (Amy)

Children also determined that repeated playground use, or the inclusion of items only for younger children results in boredom:

> "… I go there a lot and the more I go there, the more I get bored of it" (Harry)
>
> "… things where just little kids … it's just really kind of boring stuff" (Hannah)

Other children identified that they dislike graffiti, litter, and broken equipment:

> "What I don't like about skateboard parks is literally every single skateboard park has graffiti on it" (Molly)
>
> "… if somebody just puts graffiti over [the playground], people don't want to go … and litter … broken equipment that [you] could you get hurt …" (Lucy)

Still, one child identified that although they do not like graffiti in playgrounds, they do like it in skateboard parks if there's not lots of swear words:

> "I don't like graffiti in ordinary playground[s] … [but] it looks cool [in skateboard parks]… it's what makes them skate parks … if there's not like loads and loads of swear words …" (Amy)

Moreover, children also identified that the closure of skateboard parks, and the presence of bullies and gangs, makes them dislike playgrounds:

> "The skate park there. It's always closed … [Also] there was this bully blocking the slide … and he kept swearing at us" (Amy)
>
> "… a gang or something in the park and like they're smoking … I just get a really edgy vibe …" (Noah)

Additionally, some children identified that although they like monkey bars, they do not like some monkey bars because their hand slips or they move:

> "… those monkey bars … [have] leather bits on the on the rope … when you put your hands on, it just slips down" (Molly)
>
> "… they're not in place. They move about, which I don't like" (Amy)

Concurrently, adult participants identified playground dislikes; these primarily pertained to potential hazards. For example, one adult spoke about easy access to waterways when their children were younger, but the biggest challenge now is surfacing:

> "Very easy access to the river… it wasn't easy to keep an eye on smaller children … [now] the woodchip is a big challenge" (Rose)

Another adult spoke about the absence of fencing and presence of lots of children making it difficult to supervise and that there were very high items for older children:

> "…it was so big and open … there was no fence … and there [were] so many kids … you could lose track of her …" (Anna)

The same adult also expressed dislikes for very high items and roundabouts:

> "… some of the climbing frames can be quite high … if [Poppy] manages to get up onto the top … won't be able to hold her … terrified … [Poppy would] fall …" (Anna)
>
> "… roundabouts make me so nervous … when they get off and they're so dizzy … the kids were just going so fast on it. It was lethal …" (Anna)

Also, an adult spoke about aggressive fencing and enclosures that make spaces feel alienating:

> "… the message is keep out and it's very aggressive, all the fencing … basketball court beside it … again, … the level of enclosure, it's just kind of alienating" (Oliver)

The same adult also spoke about how fencing results in segregation:

> "… [parents sit] behind the fence and they can't sit inside the area … but their child is on this part of the of the playground and they're kind of alienated from it and they've got no … way of engaging …" (Oliver)

Some adults also identified that they dislike woodchip and concrete surfacing because of potential hazards:

> "… the little woodchip … they drive me demented … trying to pick them up and eat them … you wouldn't know what would be in it" (Anna)
>
> "… some places it's the surface can be concrete … having to watch themselves …" (Katie)

Also, another adult identified several dislikes:

> "…if there was an unsavoury element in terms of … a group of people you'd get a bad vibe off … wouldn't feel safe … if the equipment was in bad repair … if it's visibly dirty… drug paraphernalia … visibly soiled waste …" (Emily)

Subsequently, adult participants were asked to identify what, if anything, they look for when selecting a playground to visit with their children. One adult identified that although their child uses a wheelchair, they do not check for accessibility as playgrounds tend to be standardised:

> "… they're very standard really … you have the same things … in all the playgrounds … so, we just kind of wing it really … I never really check for accessibility or anything like that …" (Rose)

Another adult identified several considerations, most of which pertained to busyness, space, variety, and safety:

> "…not too crowded … a good element of space … good variety between older and younger kids … sense of safety … being able to kind of care in a carefree manner … being able to just do things at their ease as opposed to … if you have to queue for everything … that's hard going" (Katie)

Also, one adult highlighted considerations as they related to cleanliness, security, and the location of playgrounds in relation to roads:

> "… that it's clean … don't like to see rubbish or evidence that … people have been messing there … the location has a lot to do with it … it's secure off a road … when it comes to rivers or anything like that … it's somewhat secure… hygiene … with the sandy surface …" (Rose)

Following this, participants were asked what about playgrounds, in general, they would change. One child spoke about opening the skateboard part that is currently closed:

> "I would like if the skateboard park … would open" (Molly)

Another child spoke about the inclusion of seeds that would grow, and offer unique viewpoints:

> "Something that pops seeds out … you dig it in somewhere that you want, and then it will grow up to be really high. So, then you could see … the whole Earth" (Harry)

Another child determined that they would add planting and items to fidget (rocking items):

> "… a planting section … and also something to fidget with … springs that are attached to the ground and then you go like back and forth … those things" (Noah)

Also, one child identified that there should be different types of items and playgrounds:

> "… I think also there should be different stuff … but also, really different playgrounds" (Lucy)

For the adults then, one adult spoke about fencing and areas for younger and older children:

> "I like when they are secure with a railing or if there is a younger and older kids section separated … so that if older children are running around … [younger children are] less likely to get knocked over …" (Anna)

Another adult with older children discussed the need to include larger items:

> "Bigger slides and climbing frames" (Emily)

The same adult identified that they would like swings that cater for adults, as well as intergenerational play items:

> "… swings I quite like … there's big basket swings … for people either with very small children … or you can have a go yourself … inclusive toys where you could play with your child or else have a go of it yourself …" (Emily)

Moreover, an adult spoke about the requirement to seek inspiration from international counterparts in terms of playgrounds becoming part of the streetscape:

> "…seen a lot in the continent actually … playground is … part of the streetscape … we have a message … in Ireland that … adults who are not tied to a child are not welcome … keep out" (Oliver)

They further identified that if fencing was reconsidered, it could make playgrounds more engaging for different groups:

> " … nice if … [we had] people more fluidly engaging … not doing this stratifying and, and separating kind of activity which we … do now …" (Oliver)

They also spoke about the need to include trees and landscaping so that playgrounds are not artificial and sterile:

> "… the notion is that it has to be either tarmac, concrete or recycled car tyres that are bouncy … [creates a message that] playing is art is artificial. Playing is different. Playing is not life … playing separate from other places … And there's a lack of landscaping. … so, like they're kind of sterile places so often" (Oliver)

They went on to offer an example of a playground with crash barriers, and identified that contracts are often an issue and subsequently play is compromised:

> "… they even have crash barriers … throughout quite a small playground … satisfying a contract as opposed to … is this fit for purpose … and the message is appalling … and of course the… functionality of the playground is actually reduced" (Oliver)

Also, they noted that what children are learning in school, is opposite to what they see in playgrounds:

> "… climate change and climate action …then suddenly they … walk into a playground which is meant to be a major place they spend their so much of their young lives and it's sterile. It's plastic, its metal, and its high carbon and it's got nothing to do with those things potentially…" (Oliver)

They further identified that feedback and engagement with end users isn't happening:

> "… feedback and engagement it, it isn't happening … the problem is people want to have a single point of delivery, a single contract … and we walk away …" (Oliver)

Consequently, they determined that there is a need to adopt an integrated approach whereby numerous professionals could be included in playground design and delivery:

> "… it might be that you've actually got a horticulturalist, installing one part and a fabricator, or … manufacturer installing something else, so it might be more than one contract … then it might change the thinking …" (Oliver)

More generally, then, when asked to determine what stops them and their children from using playgrounds. One adult spoke about bad weather and busyness:

> "Bad weather and if the playgrounds are likely to be too busy" (Katie)

Another adult identified that open playgrounds (with no fencing), and playgrounds targeted towards older children deter them:

> "If they are very open … aimed at older kids …" (Anna)

Also, another adult reported that because their children are getting older, they have outgrown playgrounds targeted towards younger children:

> "They're getting older … we don't really go to … [playgrounds with] … equipment based for younger kids now … they've outgrown them" (Emily)

Concurrently, child participants reported that the location of playgrounds, and playgrounds aimed at younger children stops them from using playgrounds:

> "… too far away or they're for younger people" (Noah)
>
> "… based for younger children … not very fun" (Hannah)

Playground users

When asked to identify who they play with in playgrounds, child participants identified numerous play partners. The youngest child participant spoke about playing with their parents:

> "Mommy and daddy" (Poppy)

However, the older children identified that they play with their siblings, friends, students from their class in school, and/or other people they meet at the playground.

> "Siblings and friends" (Alfie)
>
> "… we don't really know the other kids there. But if we go with our friends,

we'll play with them, and we'll play with each other [referring to siblings]" (Noah)

"… normally always someone like from your class or in your school that …you can play with" (Molly)

"My sister and if we got any friends … or if we see if we saw anyone there" (Amy)

For the adult participants, the focus was primarily on their children. However, some adult participants spoke about meeting friends:

"Would often go to meet friends there" (Rose)

"… … some of the girls …" (Anna)

Also, with consideration for people of all ages and abilities, participants were asked who they think playgrounds are for. One child participant identified that playgrounds were for all children:

"I think they should probably be for all children" (Harry)

When asked whether playgrounds should be for older children by their father, one child reported that if they never caused trouble, they should be allowed to use playgrounds:

"… they should be all welcome … if they've never caused trouble … or done something wrong … why should they be banned just because they're older" (Amy)

Another child reported that it depends whether they are bullies, or just want to hang out with friends:

"Yes and no, because some of them are bullies, but some of them just want to hang out with their [friends]" (Molly)

Other children identified that playgrounds were for everybody, and some determined only if they respected the space:

"… I think everyone should be allowed" (Lucy)

"… as long as you respect it … people … graffitiing … ruins it" (Hannah)

"…if they're doing, like, bad things and, like, graffitiing, I don't think they should be allowed in there …" (Noah)

When asked whether adults need to have children to go to a playground, one child identified:

"Either adults or minders, whichever they have" (Harry)

Moreover, when asked whether they think that adults that do not have children should be in a playground, one child noted this was dependent on what the adult was doing:

> "…it depends [on] what the adult is doing in that playground. If they're generally having fun like, they can stay" (Hannah)

When asked if they think adults should not be there if they don't have children, one child identified that adults should have a chance:

> "No, I don't think that's reasonable … adults should have a chance" (Lucy)

The same child identified that if adults were not loitering, they were welcome in the playground:

> "… adults should have a chance … if they're like meeting up with some friends and they just [want to] sit in like a little bench … I just don't think that they should be loitering because that's kind of creepy" (Lucy)

Furthermore, offering an example of a playground in a different country, one child determined that adults play if playgrounds are designed with items for their use:

> "… people say like that … adults don't like playing around … but actually that's not true because when we went there was like loads of things, but they were like designed … not just for like people our age … [but designed for] everyone …" (Lucy)

The same child identified that playgrounds should be for everyone, because everyone should have more fun in life:

> "… I think everyone should … Even if you're a really old person or like a really young person or a well, teenage, whatever, I feel like everyone should … just have more fun in life…" (Lucy)

When asked whether very old people should be able to use a playground, some children reported that they should be allowed to, but considered falling as a potential hazard:

> "Unless they fall" (Hannah)
>
> "They should be allowed because you don't normally see them … if they think they're going to fall … it's their decision … otherwise it's just not really fair" (Lucy)

Adult participants primarily identified that playgrounds were for families. One adult identified that they like to know who is in the playground, but that it is okay to bring extended family:

> "… extended family … you wouldn't mind … but if there is … some new people … I'm like who are ye?" (Anna)

The same adult reported that they typically wouldn't see children older than 12-years-old using the playground:

> "… I wouldn't say you'd see more than a 12-year-old in the playground really" (Anna)

When asked whether they think that playgrounds should be for everyone, one adult noted that they were conflicted between idealising a streetscape scenario, and considering adults intentions of being there if they do not have children:

> "…I feel conflicted … I'm describing to you like what you see in Berlin or Frankfurt where the playground is part of the streetscape, and it isn't divided … and then there's a part … wondering, well, what are you doing here if you don't have children … [but that's not to say that] people without children … aren't interested in children … I don't have an easy answer on that" (Oliver)

Furthermore, child participants were asked to determine what younger children, older children, and adults can do when they visit playgrounds. For younger children, one child identified that they could play with sand in the younger children's section of the playground:

> "… sand … that's the side for younger kids" (Harry)

Another child spoke about options for younger and older children to take different routes to a slide:

> "… it's quite difficult to get up to maybe the slide … older kids might choose the more difficult like ways to get up to the slide. Then the younger kids might just choose the steps " (Amy)

Also, one child identified that they would add items for younger children:

> "… like a box … it would have like maybe a little table or something and a little like doorway and then different ones could connect … like rooms in a house" (Molly)

For older children, one child spoke about existing items that they themselves like:

"… the zipline … slides" (Alfie)

One adult identified numerous items in their local playground that are for older children:

"… spinning teacup … big … rope swing… two bigger swings … zip line and the high climbing thing. So, there is a good bit for the older kids …" (Anna)

Another child identified that older children could do obstacles that they themselves are not yet able to do:

"… there's … tricky obstacle courses that I … can't do" (Harry)

Also, other children identified that they would add items for older children:

"slippy slides" (Amy)

"Bench" … they'd have to sit there [with the adults] but they're allowed to go on their phones" (Molly)

For adults, one child determined that they don't think there is anything for them to do besides watch their children, but added that there are benches:

"The grownups I don't think have anything that they can go on; just look at their kids … there is some benches there" (Harry)

A younger child, that previously identified they play with their parents noted:

"We have so much fun [referring to playing with parents]" (Poppy)

Another child identified that they would add a bench for adults:

"Bench" (Amy)

When asked whether they like for adults to be able to see them at all times on a playground, children reported that they like when they can and cannot:

"Both" (Amy)

"I like places where they can see you because like if you're doing this particular trick … they'll be able to see" (Molly)

Additionally, when asked about persons with disabilities using a playground, child participants identified some items that children with disabilities could use. One child identified that children with disabilities should be able to use the same equipment as their own age group:

"… don't think that they that someone that is disabled should be using different equipment … they should be in the same age group …" (Noah)

One adult determined that a swing and talk tubes may be useable:

> "… massive child swing … they [referring to children with disabilities] can be lifted in and out … you can take the bar off altogether … two little sunflowers and you can talk into one and the other person is a bit away and you can hear them …" (Anna)

However, they noted that some swings are not useable:

> "… the other playground only has … the little rubber baby swings they wouldn't be able to use them … (Anna)

In sum, for can I play there, participants described their favourite playgrounds, other playgrounds, when they cannot use playgrounds, and playground users; participants primarily focused on features that promote use, however they described barriers also.

Can I stay there?

When asked to identify reasons as to why certain playgrounds were their favourite, participants identified factors that related to can I stay there; these included: what makes playgrounds feel welcoming, the availability of facilities/ support items, and the availability of other activities.

What makes playgrounds feel welcoming

Additionally, participants were asked to identify what makes them feel welcome in playgrounds. Children focused on natural materials, planting, environmental friendliness, and spaces looking like fun as making them feel welcome:

> " … natural materials … the park up our road … planted loads of like flowers …" (Hannah)
>
> "… everything's kind of wooded and more … environment friendly … more welcoming … Also… trees …" (Lucy)
>
> "I like seeing this really like big things to go on that just makes it look more fun" (Noah)

Also, one child identified that bars (fences) make the space feel confined, but also identified that they don't mind having fences if other users find it welcoming when there is fencing:

> "… most playgrounds have like bars around the edge … really confined … but [if there were no fences]… I feel like other people wouldn't, so I don't, I don't really mind" (Lucy)

Other children identified that low gates, and lower ramps that allow for other wheeled items are more welcoming:

> "… the gate is … less than a meter high … feels really welcoming" (Amy)
>
> " … [lower ramps in skate parks] welcomes people with bikes or scooters or rollerblades as well" (Amy)

Adults identified that although not necessarily welcoming, certain playgrounds make them want to stay more:

> "Not so much welcome but … there's certain playgrounds where you'd feel you'd like to stay more … planted … greenery and … shelter. That it's not this big open exposed space" (Rose)

One adult participant also identified the need to incorporate refreshments and adequate seating in playgrounds:

> "… the parents need to be included too … if you could get them to put coffee vans or like a little hut into every single playground … even a few more benches … if it's busy, the parents can't get a seat …" (Anna)

Availability of facilities/ support items

Adult participants also identified that the availability of facilities and support items and spaces make their stay at playgrounds more comfortable. One adult spoke about the availability of picnic benches, within sightlines of the playground, which support social activities with other parents:

> "…a few picnic benches … you'd see a lot of the mums they might bring … flasks tea or whatever. And they'd sit down, they'd have a chat … you can still see everything" (Anna)

Another adult identified that the availability of other types of seating, also support opportunities to sit and socialise with other parents:

> "… some old trees that fell. They used the trunks then as sort of seats… it's just nice to be able to sit down and have a natter if there's other parents there" (Emily)

Moreover, an adult spoke of the availability of different spaces, that support social activities with others:

> "… there's places you would hang out with your girlfriend or with your family or you'd have a picnic …" (Oliver)

Furthermore, another consideration was the availability of shelter, as it is currently lacking in playgrounds:

> "… a lack of … shelter. You know, particularly, let's say, either in bad weather or in summer …" (Oliver)

However, one child participant spoke about shelter and seating that they liked in a playground:

> "… there is lots of benches just outside playground with shelter … like a curly roof so for shelter just beside the playground" (Amy)

Availability of other activities

In terms of being able to stay in a playground, some adult participants spoke of being able to combine their visit to playgrounds with other activities:

> "… there's a good walk around it …" (Anna)
>
> " … another draw like being able to go for a walk … you'd probably stay an hour or an hour and a half" (Rose)
>
> " … combined with the other activities, because the other children will do sports training down there" (Rose)

To summarise, for can I stay there, participants identified factors that related to can I stay there; these included: what makes playgrounds feel welcoming, the availability of facilities/ support items, and the availability of other activities.

Our dream playground

Our dream playground encapsulates ideas generated by adult and child participants for their ideal (dream) playgrounds. Analysis of creative artefacts (see Figures 1 – 7) and interviews revealed key factors that dominated the families' perceptions of their dream playground. Participants identified numerous considerations for their dream playgrounds that encapsulated the previous headings (can I get there, can I/ they play there, and can I stay); thus, the findings are presented under these headings.

Can I get there?

As before, can I get there related to location, layout, and facilitators for getting there.

Location

For can I get there, child participants discussed the location of the playground. Most participants identified that they would locate their dream playground close to where they resided, so they could either walk or cycle there:

> "… prefer it to be close by … I'd probably just walk" (Hannah)
>
> "Walk … should be in like a local park" (Molly)
>
> "Walk" (Poppy)
>
> "… walk or cycle there" (Harry)

However, some participants identified that they would locate it in different locations that do not already have a playground, however, they would still be able to access their dream playground:

> "… somewhere … that doesn't have a playground … [if] it was too far away I'd probably bike, but if it was in walking distance, I might scoot or walk" (Lucy)
>
> "… we already have one … somewhere that needs it" (Noah)

Layout

For child participants, layout included consideration for age and avoiding potential hazards:

> For the younger section "one year old up to three" and for the older section "from four to thirteen" (Harry)
>
> "… decided to put [zipline] there … [to] block the zipline from hitting into the entrance, so nobody gets hurt" (Harry)

Because one participant had included an entrance point, they were asked whether their dream playground would include a fence, to which they replied:

> "I would [have] put that in, but that would be too much cardboard" (Harry)

Still, another participant noted that they were not focusing on the layout:

> "It wasn't really the layout of the playground. It was kind of like a mind map of what I'd like …" (Hannah)

In addition, layout for adult participants included consideration for how the space could be used in terms of access, and making the space more engaging:

> "… I quite like the idea that the adult area is more engaged maybe I know we have a big fence … we've got seating inside and outside the fence. But we haven't done anything as bold as considering if the fence wasn't there at all … but … the parents are more engaged … also different places where you can come in … " (Oliver)

Also, the same adult noted that traditional barriers could be broken down by considering how the planting is integrated in the space:

> "…by having trees and natural planting and levels inside as well as outside the play area you're beginning to … break things down that way …" (Oliver)

Facilitators for getting there

Facilitators for getting there pertained to environmental features that supported users getting to items and spaces, that subsequently supported participation in play. Furthermore, participants also highlighted environmental features that support users to access play equipment:

> "Ramps [to access the slide]" (Alfie)

> " … thing to hold onto wheelchair that zooms you down to the slide …" (Alfie)

With reference to being able to circumvent barriers to getting there via lifting, one adult noted that in the future independence is a key consideration:

> "…the keyword is probably independence. You know, that's that'll be the big thing …" (Rose)

Furthermore, the same adult identified that making something accessible does not require providing it in a segregated way:

> "… you have all those … medicalised type labels … [instead, there is a need to incorporate] universal design principles whereas it's just universally accessible. [Then] it's not accessible in a in a segregated way" (Rose)

Can I/ they play there?

Like before, can I/ they play there pertained to items and spaces and consideration for other playground users.

Items and spaces

Participants discussed items and/or spaces that their dream playground would contain. For example, many children identified that they would include items for: swinging,

sliding, climbing, ziplining, spinning, hanging, and jumping (Table 4). Other items and spaces identified by children included items such as swimming pools (Table 4). Child participants also discussed the inclusion of trees in their dream playgrounds, that had numerous functions (Table 4).

For adult participants, they too identified items and spaces for play, most of which had previously been considered by the child participants:

> monster truck track (sand with toys), accessible sandboxes, swing, playhouses, roundabout, slides, loads of trees, a pond, waterplay (if that could be put in safely) (Rose)
>
> "… if you could incorporate a big old tree … you could have maybe people climbing up it. Swings off it …" (Emily)
>
> " … we made sure that we drew lots of trees …" (Oliver)

However, with reference to the turtle sandbox that their child had included, one adult noted:

> "I wouldn't have sand in it … the less mess, the better" (Anna)

Moreover, adult participants also included additional considerations. One adult identified the inclusion of different landforms for play:

> "… when there's different levels … navigating through different surface levels … like a skateboard park, but … designed just for play … something dramatic about that. But there's also something challenging about that" (Oliver)

Another adult spoke about the inclusion of secluded spaces, a variety of activities that support solo and group play, as well as accessible items were also identified:

> "… it is nice to have a bit of seclusion or just that, a little corner that the whole space doesn't feel so exposed … having a variety of activities … for group play and solo play … accessible sandboxes" (Rose)

Also, one adult spoke about adding further dimensions via music:

> "… musical steps … … in terms of dancing or music or something, it has another dimension …" (Oliver)

Other parents spoke about adding further items so that adults could be more engaged in playgrounds:

> I do like the idea of toys that parents and children can play on together. I think that's a nice" (Emily)

> "… we also made sure that the area for adults or other activities was kind of almost pushing into the play area … (Oliver)

Finally, when asked if they would add any further items to their dream playground, not already depicted in their drawings, child participants identified items for jumping, rocking, and shelter:

> trampoline (Poppy, Noah)
>
> bouncy balls for "younger children" (Noah)
>
> rocking items that resemble rockets and monster trucks that are "higher" and "swing forward and backward more" (Harry)
>
> flooding umbrellas (Noah)

Other users

When asked who they would play with in their dream playground, child participants determined they would play with their friends and siblings, as well as make new friends:

> "All my friends" (Poppy)
>
> "… lots of my friends will probably enjoy it … siblings probably" (Lucy)
>
> "My friends … people would probably be nice … [so I could] make new friends" (Noah)

Moreover, when asked about what younger children could do in their dream playground, child participants identified that they could use certain items and spaces. For example, one child participant noted that their younger sibling could:

> "… walk … crawl … the slide and swing" (Poppy)

Another child reported that their two younger siblings could use:

> "… baby swings … the slide and the zipline" (Harry)

Also, other children spoke about younger children more generally, and identified that they could use certain items:

> "… hopscotch, the ground trampoline … baby swings … piano steps …" (Amy)

Other children reported that they could use certain spaces and items:

> "… the tiny little house bits connected, and … the single swings … the hopscotch" (Molly)

Also, some children determined that they could use certain spaces:

> "… chill out room maybe if like they're … younger … they could … go to sleep … if they got tired …" (Noah)
>
> "… miniature town for like the little kids …" (Hannah)

One child reported the need for younger children to use the space with their parent because of potential hazards:

> "… should go with … their parents, probably around the whole thing … slide … looks dangerous … lazy river … they could drown …" (Noah)

Additionally, when asked what older children could do in their dream playground, child participants determined that they could use certain items and larger items:

> "… tricks on swings … the climbing frame … curve at the top so then they can like stand on the top or sit on the top … the maze" (Harry)
>
> "… climb on the big rope swing thing or climb the big tree or … go on the big swing circle" (Amy)

Still, one child noted that it wasn't so much about age, but rather what individual children were comfortable with:

> "… I wasn't really thinking about all different ages … it could be for any ages … depends … what they're comfortable with" (Lucy)

Furthermore, when asked about what adults could do in their dream playground, child participants reported that their parents could open the gate:

> "Open the gate" (Poppy)

Other children identified that adults could use the space for play and recreation:

> "… go on the climbing frame, or … play with the younger kids in the sand" (Harry)
>
> "… sit at the picnic table … play table tennis, or … play chess … chase the children …" (Molly)
>
> "… the adult area … there's some chess boards …" (Amy)

When asked if they would add anything else for adults, one child participant noted that they would add:

> "… the hardest obstacles I would think of" (Harry)

The same child was asked whether they would be able to play with the adults in the obstacle course; they replied:

"No … that would be way too scary …" (Harry)

Some child participants also made considerations for users with visual impairments or users that may be overwhelmed in their dream playground. They noted:

"… made … a blind side … we made … [a colourful] hopscotch for them and … xylophone. And … that's for fully blind people to touch. So, then they could try and see is it a square or circle or stuff like that … also … we have the alphabet … under each letter we have … spots [Braille] for them to feel …" (Harry)

" … for people who would find … this a bit overwhelming, I added a sensory room … if they wanted a break, they [could] go in there, just [to] cool down" (Hannah)

When asked whether people with disabilities could use other parts of the playground, one child identified that they could use the following:

"The swing. The slide, I think … the sand" (Harry)

Can I stay there?

For their dream playgrounds, can I stay there pertains to what makes the playgrounds feel welcoming and the availability of facilities/ support items.

What makes the playground feel welcoming

Can I stay there was primarily a consideration made by adults. In addition to the play items identified previously, adult participants also identified that the inclusion of several items and spaces that would make their dream playground a nice space to spend time in. Some adults spoke about the inclusion of greenery, planting, and trees:

"… greenery. Nature, flowers … trees …" (Emily)

"… trees and planting … greening the space so it's not so artificial … [and] feels like a nice space to spend time in … (Rose)

Also, an adult identified that the addition of landscaping, shelter, trees, and planting would make the area nice:

"…landscaping would make it … interesting … to look at, and … there'd be … drama given by the trees, by the planting …" (Oliver)

Availability of facilities/ support items

For availability of facilities/ support items, most adults spoke about the inclusion of shade/ shelter and picnic tables:

> "… shade … if it's raining or if it's too hot … to stand under" (Emily)
>
> "… there'd be shelter …" (Oliver)
>
> … the picnic tables … it makes an occasion; you can bring a snack … a shaded area …" (Rose)

Also, one adult and their child identified that the inclusion of toilets and bins would make their dream playground a nice place to stay:

> " … the idea that there actually are toilets provided, which is incredibly rare" (Oliver)
>
> "… toilets and … lots of bins …" (Molly)

In sum, our dream playground encapsulates ideas generated by adult and child participants for their ideal (dream) playgrounds; these included considerations for how they access, move around in, participate in outdoor play and recreation, and are supported to stay in their dream playground.

Discussion

The purpose of this study was to understand the experience of playground use and/or non-use from the perspectives of children and adults to determine overall usability of playgrounds, through the lens of play and play value to inform UD. In sum, results revealed that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. In this way, participants confirmed that diverse factors require consideration to ensure that play spaces offer varied play experiences and facilities for all, which aligns with findings from previous international research (Lynch et al., 2018; Moore, Boyle et al., 2022b; Moore, Lynch, et al., 2022a; Parker & Al-Maiyah, 2022; Woolley & Lowe, 2013).

Nevertheless, as noted previously, few efforts to date have been made to understand the experience of playground use from diverse user perspectives. Moreover, where efforts had been made, a recent scoping review study revealed that studies have relied on the accounts of adults primarily (Moore, Lynch, et al., 2022a) and other researchers have confirmed that such an approach means that design occurs with limited contextual understanding of the lived experience (Moore, Boyle, et al., 2022b). Yet, in this study, the adoption of a framework developed by colleagues in New South Wales (Can I get there? Can I play? Can I Stay?) (NSW Government, 2019) to frame the findings contributes to the identification of ideas, from the perspectives of children and adults, to support public playground design for inclusion. Indeed, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion.

Still, other researchers have confirmed that play space provision needs to reflect the play preferences of local users (Parker & Al-Maiyah, 2022), while other researchers have confirmed that it is essential to begin with a user's perspective when considering a UD approach for playground design (Moore et al., 2022a; Prellwitz & Lynch, 2018). Additionally, other researchers have recently identified that there is a need to tailor UD to include play as a central concern (Moore, Lynch, et al., 2022a, 2022b; Moore, Boyle, et al., 2022a, 2022b); however, results from this study identify that such development also needs to include consideration of "user experts". Therefore, we argue that for UD to fully realise its potential in underpinning the design of public playground for inclusion, it is essential that public playgrounds are co-designed and co-created with "user experts" and "professional experts" (i.e., those with technical expertise) to ensure that the play preferences of local users are reflected in provision efforts.

Furthermore, recent research in Ireland (Moore, Lynch, et al., 2022b) and Sweden (Wenger et al., 2022) has revealed that "playground experts" lack knowledge on how to design for diverse user groups. As such, including "user experts" alongside "professional experts" ensures that resulting provision efforts reflect both the play preferences of local users, and incorporates contextual understandings of the lived experience (Moore, Boyle, et al., 2022b). Such an approach aligns with recent

developments whereby researchers have advocated for the need to include users alongside professionals in the context of supporting sustainable user participation (Jansson, 2010; Jansson, 2015; Jansson et al., 2019; Sundevall & Jansson, 2020). To support such developments, there is a need for further policy development in international and national contexts that address the inclusion of children and adults in designing for inclusive play, so that any response to play provision are culturally relevant and not universally applied as no one size fits all (Lynch, 2022).

Finally, to safeguard the implementation of UD at an international level, there is a need to ensure that successor documents to GC 17 (CRC, 2013) place further emphasis on how to include children in designing for play and how to translate UD into practice. Finally, further research is needed to address the limitations of this study; consistent with international research, further international research with diverse user groups (e.g., migrants, lower socioeconomic communities, intergenerational users with disabilities) is required to build knowledge of a user's perspective and subsequently strengthen knowledge on socio-spatial inclusion so that the UD concept to reach its full potential as a medium for social justice in playground design for inclusion (Lynch et al., 2020; Moore, Lynch, et al., 2022a, 2022b).

Limitations

Consideration of the methods used to gather data could be viewed as a strength and a limitation. Specifically, the methods chosen for this study were consistent with qualitative research, meaning a small number of participants were recruited to the study. Therefore, there is no intention to generalise to a larger population or to other contexts as this qualitative study is restricted to a small group of children and adults in Ireland. Moreover, the fact that the participants were only interviewed once can be considered a limitation since a second interview may have added further information. Additionally, individual interviews, instead of group discussions, may have made it possible to examine and compare the views of individual children and adults. Finally, evidence from families that do not use playgrounds as well as reasons for non-use is not included as all participants in this study were playground users.

Conclusion

This study contributes an Irish perspective to the growing international body of knowledge on public playground design for inclusion, from the perspectives of "user experts". Results from this study revealed that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. Nevertheless, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion. Therefore, for UD to fully realise its potential in underpinning the design of public playground for inclusion, it is essential that public playgrounds are co-designed and co-created with user experts and professional experts so that contextual lived experiences can be incorporated, and thus, usable playgrounds that meet the needs of end user groups can be designed and provided.

Tables

Table 1: Gatekeepers that supported recruitment of family units in the Republic of Ireland

Gatekeeper role	Number of family units recruited
Head of services (disability organisation)	One (one parent and one child)
Parent and occupational therapist	Three (three parents and seven children)
Parent and primary school teacher	One (one parent and one child)

Table 2: Participant demographics

	Participant	**Pseudonym**	**Residence**
Family 1	Parent (Mother)	Rose	Suburban (Munster)
	Child (age 6; wheelchair user)	Alfie	
Family 2	Parent (Father)	Oliver	Suburban (Leinster)
	Child (age 10 [age 11 for focus grp]; female)	Amy	
	Child (age 9; female)	Molly	
Family 3	Parent (Mother)	Katie	Urban (Leinster)
	Child (age 7; male)	Harry	
	Child (age 5; male)	Jacob	
Family 4	Parent (Mother)	Anna	Rural (Connacht)
	Child (age 3; female)	Poppy	
Family 5	Parent (Mother)	Emily	Urban (Leinster)
	Child (age 13; female)	Hannah	
	Child (age 11; female)	Lucy	
	Child (age 11; male)	Noah	

Table 3: Questionnaires for child and adult participants

	Child questionnaire	**Adult questionnaire**
Number of items	18-items	20-items
Number of items for playground users	15-items	17-items
Number of items for playground non-users	9-items	10-items
Quantitative items (closed questions)	9-items	10-items
Qualitative items (open-ended questions)	9-items	10-items

Table 4: Dream playground ideas

Swinging items	Swings (Poppy, Harry, Lucy) Rope swing (Lucy, Amy) Tyre swing (Molly, Amy) Swinging chairs (Noah) Wheelchair swing (Alfie) Swings with boat attached (Hannah)
Sliding items	Slide (Alfie, Poppy, Harry) Tunnel slide (Lucy) Loopy loop slide (Lucy) Water slide (Noah, Hannah)
Climbing items	Climbing frame (Harry) Ladders (Lucy) Rope elevator (Noah) Stairs (Noah)
Ziplining, spinning, hanging, and jumping items	Zipline (Alfie, Harry, Hannah) Roundabout (Alfie, Harry) Monkey bars (Poppy) Ground trampoline (Molly) Hopscotch (Amy)
Other items and spaces	Maze (Harry) Swimming pool (Alfie) Lazy river (Noah) Train (Poppy) Treehouse (Amy) House area (Amy) Piano steps (Amy) Sauna, pizza oven, table for pizza (Alfie) Turtle [sandpit] (Poppy) Buffet … with like loads of different foods … a zero gravity … place …" (Noah) Chill out room or sensory room (Noah, Hannah) Miniature town (Hannah)

Functions of trees	Environmental friendliness (Lucy) Items for swinging (Molly, Lucy) Items for climbing (Molly, Lucy, Noah) Treehouses (Molly, Lucy, Amy) "… nest … so a bird can live there as well" (Molly)

Figure legends

Figure 1: Alfie's dream playground

Figure 2: Oliver, Amy, and Molly's dream playground

Figure 3: Harry and Jacob's dream playground

Figure 4: Poppy's dream playground

Figure 5: Hannah's dream playground

Figure 6: Lucy's dream playground

Figure 7: Noah's dream playground

Figures

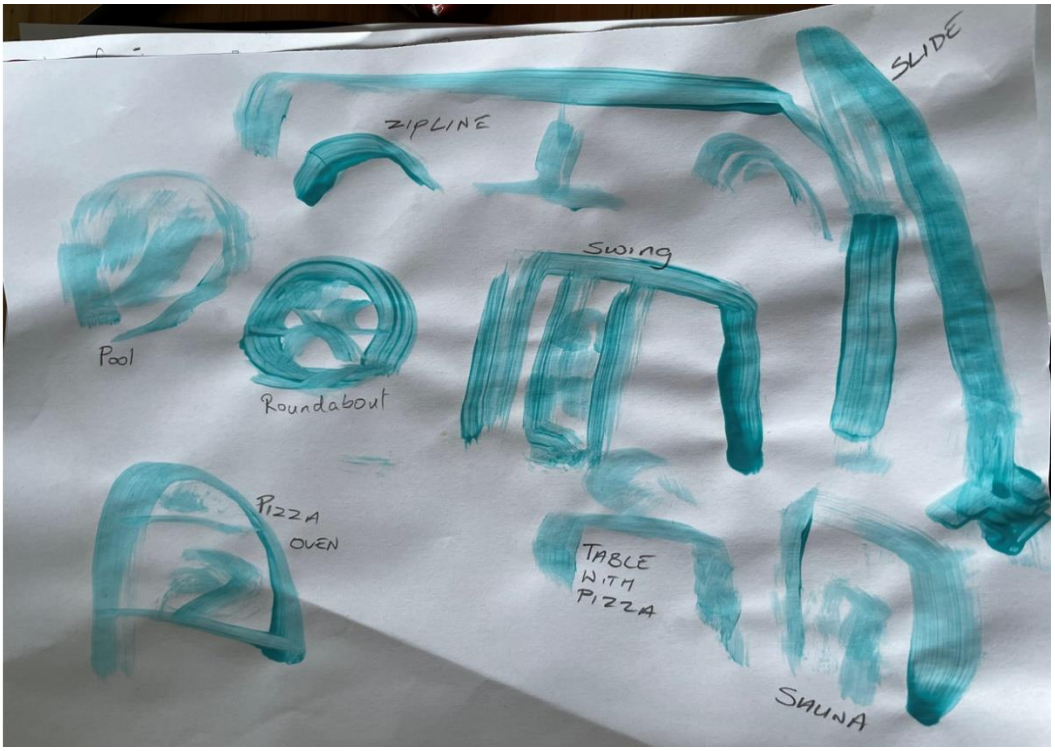


Figure 1: Alfie's dream playground

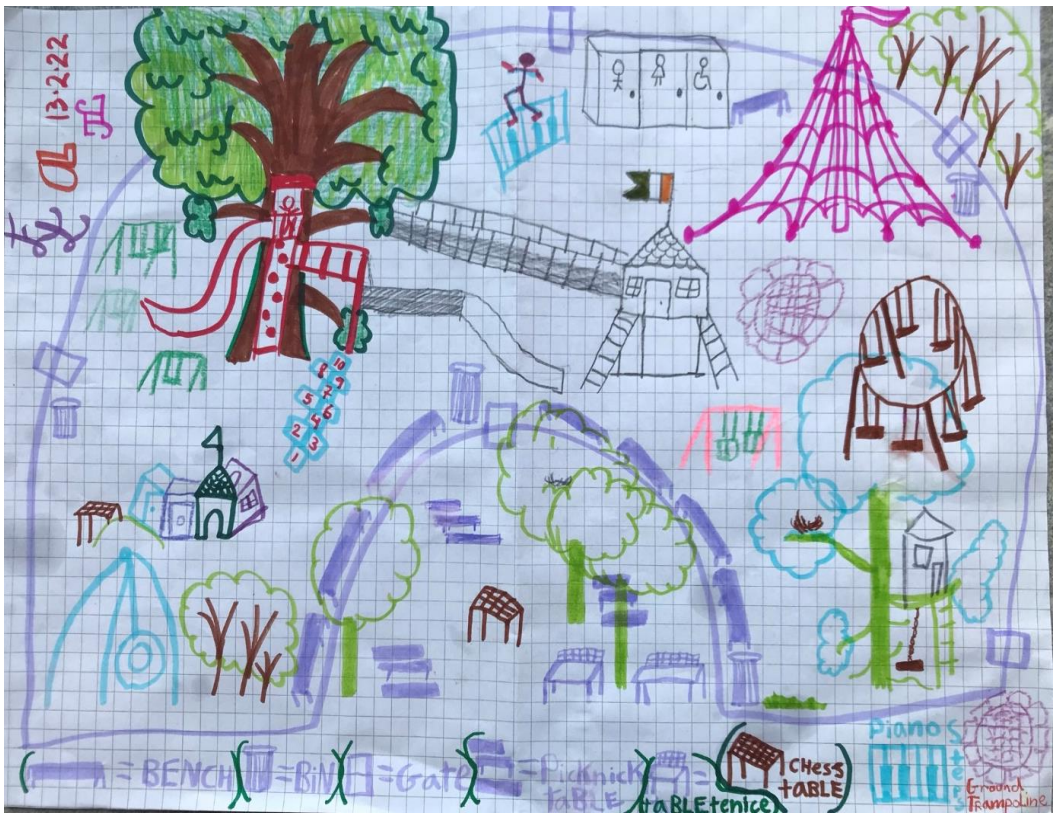


Figure 2: Oliver, Amy, and Molly's dream playground



Figure 3: Harry and Jacob's dream playground

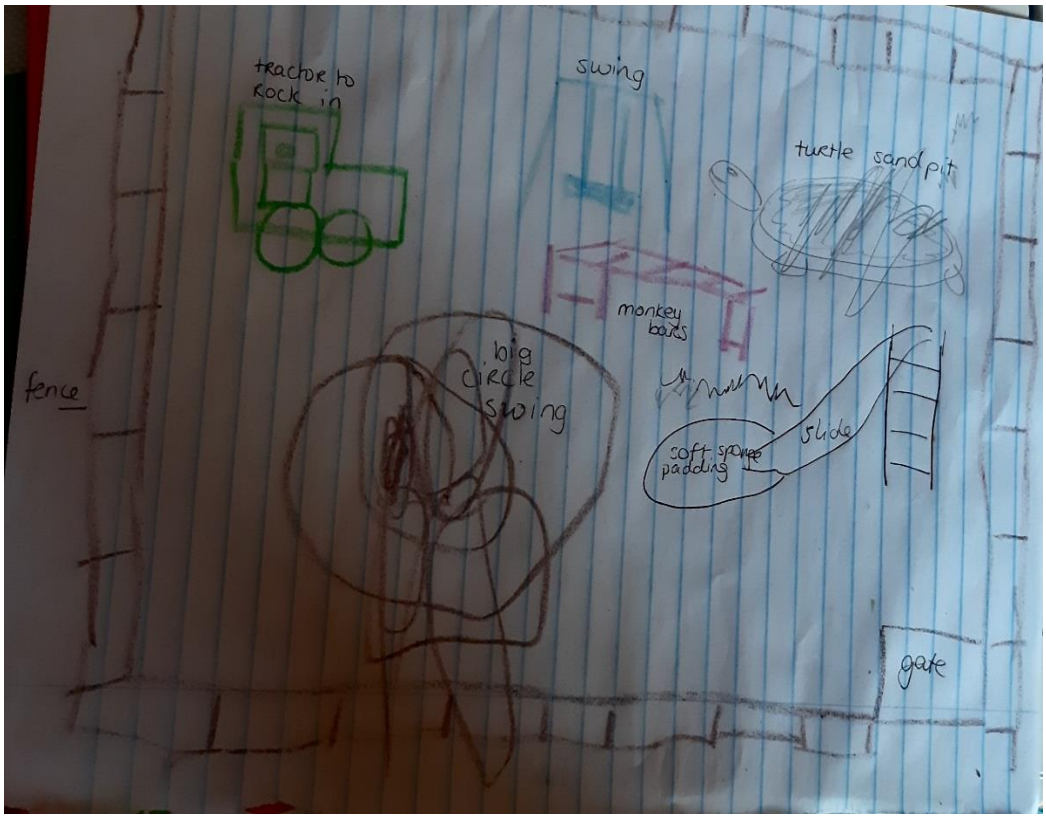


Figure 4: Poppy's dream playground



Figure 5: Hannah's dream playground



Figure 6: Lucy's dream playground

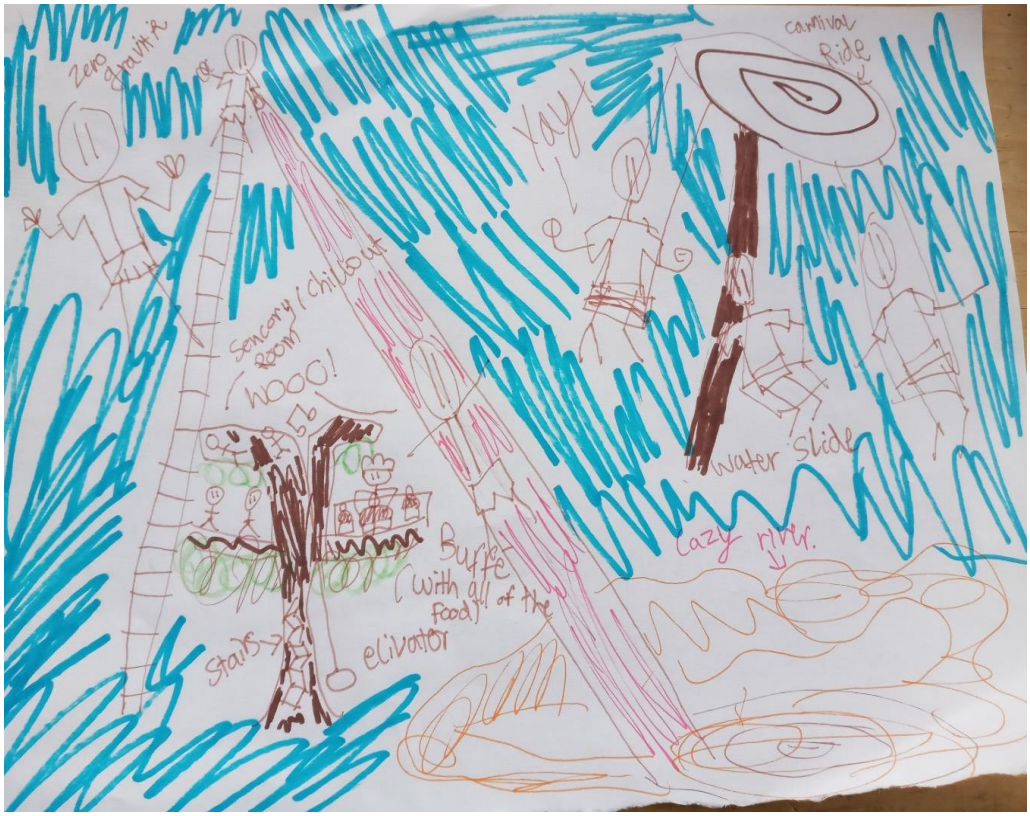


Figure 7: Noah's dream playground

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Chapter Eight: Impact case study

During the timeframe of the PhD, at the same time a parallel project emerged that was closely aligned with the research being undertaken. Although this project did not form part of the studies for this thesis, it became an important process for enhancing the need for the thesis, supported further enhancement of insight, and provided an important backdrop to potential impact of the study itself. In other words, it became part of the doctoral work in supporting the PhD candidate to apply new learning, explore implementation, and most of all, determine potential impact.

This chapter outlines the impact project, carried out over two years in a voluntary capacity, to support a newly established not-for-profit organisation in Ireland, in their efforts to build an inclusive play and recreation space. The PhD candidate and her primary supervisor (Dr Helen Lynch) engaged in a process of shared problem solving with Crann Centre staff and service users to work out the best way of designing an inclusive play and recreation space. To determine priorities, a process of co-design, was established. What followed was a fundraising campaign of €500,000 to construct the new play and recreation space.

The new play and recreation space was officially opened on 02 July 2022. It is a model for what inclusive outdoor play and recreation can really look like when "user experts" are consulted and included by "professional experts" when co-designing play and recreation spaces. Although not part of the PhD project necessarily, this project further contributes an emerging evidence base for using UD for the design of play and recreation spaces, and therefore, further addresses the overall aim of this thesis. Moreover, the project served to further enhance the PhD candidate's knowledge (e.g., UD, play, inclusion) and skill sets; thus, this impact case study project is of significant relevance to this doctoral research.

Further information on this project with the Crann Centre and its relationship to this doctoral research is presented in the body of this chapter. Of note, the narrative of this chapter is presented in the first person to present a more 'personal' journey and communicate the sentiment of this work as well as its scientific value.

Introduction

This chapter presents a project I was involved with over the course of my PhD studies. Presented here as an impact case study, the project in question was a collaborative project, carried out over two years in a voluntary capacity, to support a newly established not-for-profit organisation (Crann Centre) in Cork, Ireland, in their efforts to build a state-of-the-art inclusive play and recreation space. Implemented across five key phases, this project turned "user experts" (children and adults with neuro-physical disabilities and their families) into playground designers. These "user experts" worked with a team of "professional experts" (Crann staff and board members, occupational therapists, and a design team) to co-design their dream play and recreation space. The project is described below.

Project setting

Founded in 2018, Crann is a not-for-profit charity located on Classis Road, Ovens, Cork, Ireland. Inspired by the tree of life, Crann is committed to providing global best practice services to people (children, young people, and adults) with neuro-physical disabilities and their families. Their services are focused on, but not limited to, providing lifelong support for people who have Spina Bifida, Hydrocephalus, Muscular Dystrophy, Cerebral Palsy, Multiple Sclerosis, Childhood Stroke, and Spinal Cord Injury (Crann Centre Ireland, 2022).

Crann's Model of Care (based on the Aspen Institute 2Gen approach) reflects the fact that people with a disability have a family network. Therefore, Crann develops personalised solutions to deliver ground-breaking, seamless services that people with neuro-physical disabilities and their families need to flourish (Crann Centre Ireland, 2022). Placing families at the centre of their services and policies, Crann has built their model of care around six key service areas[58], meaning that supports can be provided that target one aspect, or can be provided in a holistic manner to support a broad range of needs (Crann Centre Ireland, 2022).

[58] Six key areas: (1) health and continence, (2) psychological wellbeing, (3) mobility, (4) education and career pathways, (5) community and networks, and (6) independent living

Background to the project

Play and recreation spaces are important places to gather, rest, socialise, and participate in play and recreation (Lynch et al., 2019). They provide opportunities for play and leisure for diverse intergenerational users (Lynch et al., 2019). However, many individuals, particularly those with disabilities, experience play and recreation spaces as sites of spatial and social exclusion because of physical barriers to access and social barriers to participation (Lynch et al., 2019, 2020; Moore & Lynch, 2015; Prellwitz & Skär, 2007; Prellwitz & Skär, 2016). Significantly, researchers have attributed these barriers to poor design primarily, resulting in inaccessible and unusable spaces (Lynch et al., 2019, 2020; Prellwitz & Lynch, 2018). As Crann provides services to persons with disabilities, it was important that such design issues would be avoided.

Nevertheless, the right to play and recreation as well as access to the physical environments for play and recreation is enshrined in the United Nations Convention on the Rights of the Child (UNCRC) (United Nations [UN], 1989) and further endorsed in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (UN, 2006). Moreover, General Comment No. 17 (GC17) on play and leisure (Committee on the Rights of the Child [CRC], 2013), General Comment No. 2 (GC2) on accessibility (Committee on the Rights of Persons with Disabilities [CRPD], 2014), and the National Play Policy in Ireland (National Children's Office [NCO], 2004) all endorse Universal Design (UD) as the recommended design approach when designing environments that are accessible, usable, and inclusive of all. Therefore, UD was an important consideration in the context of our work with Crann.

However, when considering a UD approach, it is essential to begin with a user's perspective (Heylighen et al., 2017). Indeed, Attoh (2011) asserted that having a right to something (i.e., the right to play and recreation as well as access to the physical environments for play and recreation in this case) also entails "the right not to be marginalized in decision making" (p.676). Even so, involving user experts in general, and disability experience in particular, is not yet a common practice in built environment design (Heylighen et al., 2017). Certainly, in the context of playgrounds, a recent scoping review of the evidence found that most studies relied on the accounts of adult caregivers as a proxy for exploring children's perspectives of playgrounds

(Moore, Lynch, et al., 2022a). Nevertheless, research is continuing to confirm that co-design approaches that position communities at the heart of the design process is required for UD to realise its potential in playground design (Moore, Boyle, et al., 2022a, 2022b; Moore, Lynch, et al., 2022a, 2022b). Hence, in our work with Crann, both UD and co-design approaches were essential concepts in our work.

Therefore, when an opportunity came about to provide a play and recreation space in January 2020, it was never going to be an exception to the rule of best practice for a not-for-profit organisation in Cork, Ireland – the Crann Centre (referred to hereafter as Crann). To extend and build upon the services already offered at Crann, the aim was to develop an inclusive intergenerational play and recreation space for all. To assist in this ambitious endeavour, Crann teamed up with my primary supervisor (Dr Helen Lynch, referred to hereafter as Helen) and I, who were also supported by an undergraduate student in Summer 2020. Subsequently, a community project was commenced to work together to explore the outdoor play and recreation needs of Crann members.

Of note, Helen and I are committed to developing evidence on how to design playgrounds that support outdoor play, social participation, and inclusion. This vision was shared by Crann as they pride themselves on best practice (Crann Centre Ireland, 2022); therefore, it was essential that we incorporated best practice highlighted previously as well as contributed to the emerging evidence base on UD for playground design. Building upon our collective research experiences, spanning several years (e.g., Blake et al., 2018; Kilkelly et al., 2016; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Moore & Lynch, 2015, 2018), and because this project closely aligned with my PhD research, Helen and I agreed to play a lead role in determining the priorities for the play and recreation space, alongside "user experts" (i.e., Crann members).

To guide this work, a framework developed in New South Wales, Australia, was adopted. The framework was underpinned by three guiding principles – can I get there, can I play, can I stay? (New South Wales [NSW] Government, 2019). Also, in line with best practice, UD provided conceptual guidance when designing for all. Furthermore, to determine priorities, a process of co-design, was established to

empower Crann members to reflect disability-based understandings of what was important in play and recreation spaces, to enable UD to reach its full potential as a medium for social justice. Like my doctoral research, this project was also underpinned by a human/child rights-based approach.

Description of the project

Implemented across five key phases, this project turned "user experts" (children and adults with neuro-physical disabilities and their families) into playground designers. These "user experts" worked with a team of "professional experts" (Crann staff and board members, occupational therapists, and a design team) to co-design their dream play and recreation space. From project inception to delivery, it took 30 months (January 2020 – July 2022) in total. The five key phases are identified in Figure 1 below and described in detail thereafter.

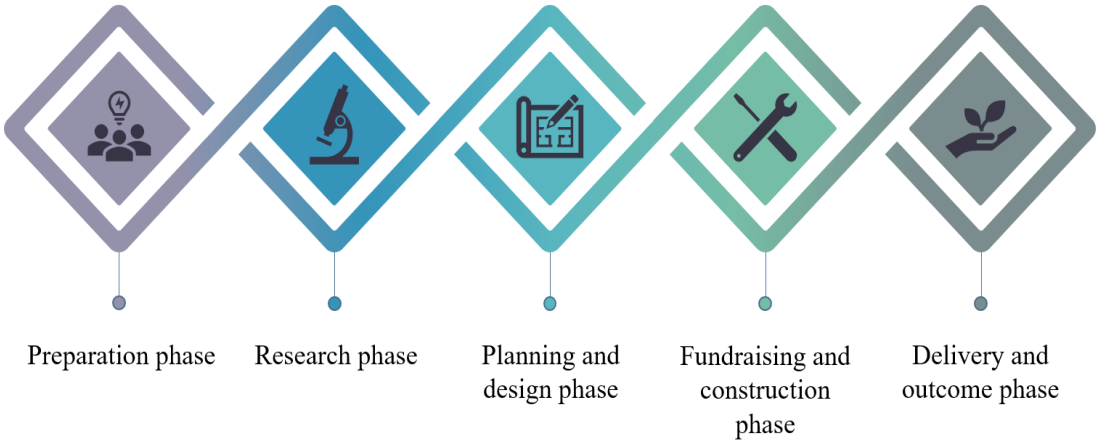


Figure 1: Five key phases for project from project inception to outcome

Phase One: Preparation phase

The first phase of the collaboration included two key components, namely, reaching a shared vision, and ethical approval to conduct the study.

Reaching a shared vision included shared problem solving and planning to arrive upon a research approach to underpin the design of the new play and recreation space at Crann. Leveraging on their best practice approach, and in response to this real-world problem, it was decided that a process of co-design would be utilised to empower

Crann members (children, young people, adults, and their families) to reflect disability-based understandings of what was important in play and recreation spaces and determine priorities for the new play and recreation space at Crann.

Therefore, to undertake this co-design project with Crann members and following several planning meetings with the staff in Crann, Helen and I prepared an ethics application. Permissions were sought to complete electronic questionnaires (with children, young people, adults, families, and Crann centre staff) and follow-up semi-structured focus groups (with children, young people, adults, and their families) to elaborate upon the findings from the electronic questionnaires and to feed back on the site plans. This ethics application was submitted for approval from the Social Research Ethics Committee (SREC) in University College Cork[59] in March 2020. Ethical approval to conduct the study was obtained from the SREC in April 2020 (Log 2020-054).

Of note, within the first three months of Phase One, the outbreak of the COVID-19 pandemic started in Ireland and was a considerable influence on the potential project development for the duration of the project due to strict lockdowns and restricted working capacity across all sectors of work.

Phase Two: Research Phase

The research phase included three key components, namely, electronic questionnaires, focus group discussions, and the compilation of a user-friendly report for the design team (comprising an architect, builder/playground provider, and carpenter).

Indeed, following ethical approval, three electronic questionnaires were distributed in April/May 2020 to the following groups: (i) children/young people, (ii) parents/ guardians, and adult service users, and (iii) staff/ those that contribute to service provision. The purpose of these electronic questionnaires was to determine needs, wants, and desires for the new play and recreation space at Crann. A combined 48 participants responded to the electronic questionnaires.

[59] https://www.ucc.ie/en/research/support/ethics/socialresearch/

Following the completion of the electronic questionnaires, twenty-one participants voluntarily agreed to participate in focus group discussions, to further elaborate upon the information provided in the electronic questionnaires and to ascertain their needs, wants, and desires for the new play and recreation space at Crann. Online focus groups were held in June/July 2020, with (i) children; (ii) young people; (iii) adult members; and (iv) family members. Participants were also invited to submit drawings/ artefacts/ emails of their ideas to Helen and I, or alternatively, to Crann staff members.

Overall, user experts (i.e., children, young people, adults, and family members) sought a space that was inclusive of all. They did not desire a space that was designed specifically for persons with disabilities, but, rather, a space that was welcoming, inclusive, and fun for all. For children and young people, they particularly desired a space whereby they could play/ hang out with peers, and experience things that are not typically available to them in public playgrounds (e.g., accessing the highest place in the playground; accessible swinging options). For adults, a key focus pertained to making the space accessible and inclusive for all children (whereby children could be autonomous and independent), and having a comfortable (e.g., provision of seating) and a nice place (e.g., incorporate nature) to hang out and socialise.

Subsequently, I led on the development of a user-friendly report by translating the voices of participants in a way that could be actioned by the design team assigned responsibility for designing and providing the new play and recreation space at Crann. The report comprised findings from the electronic questionnaires and focus groups, and included two main sections:

- **Section A** detailed a summary of main findings, from the electronic questionnaires and focus group discussions, as they pertained to the planning and design of the new play and leisure space at Crann (common barriers and desired play items).
- **Section B** described strategies/ recommendations for including the desired play items while also considering play value, inclusion, and universal access.

I also developed mood boards to communicate ideas and offer design inspiration (Figure 2).



Figure 2: Mood boards to communicate ideas and offer design inspiration

Phase Three: Planning and design phase

Helen and I met with the design team on numerous occasions to ensure that the members' needs, wants and desires for the play and recreation space were included, resulting in an agreed plan being devised. With the agreed plan, Helen and I led on reviewing the plans for the play and recreation space via focus group discussions online with (i) children; (ii) young people; (iii) adult members; and (iv) family members. These discussions primarily pertained to figuring out what worked, what did not work, and what needed to be changed.

Informed by the information gathered from these focus group discussions, Helen and I reverted to Crann staff members and the design team. In total, five iterations of the plan followed to ensure that options for use of space and incorporation of as many ideas possible was maximised. The changing nature of the plan over time meant that the play and recreation space went from a small space looking at catalogues to a large space incorporating play items with affordances for different play types as well as opportunities to explore risk and challenge. Moreover, gym items, social gathering spaces, as well as a sensory garden and raised beds area were also included. A final plan was then agreed in Autumn 2020, this is shown below in Figure 3, and a hyperlink to a YouTube video[60] is also provided for a description of the plan.

[60] https://www.youtube.com/watch?v=hYi5W3xssXU

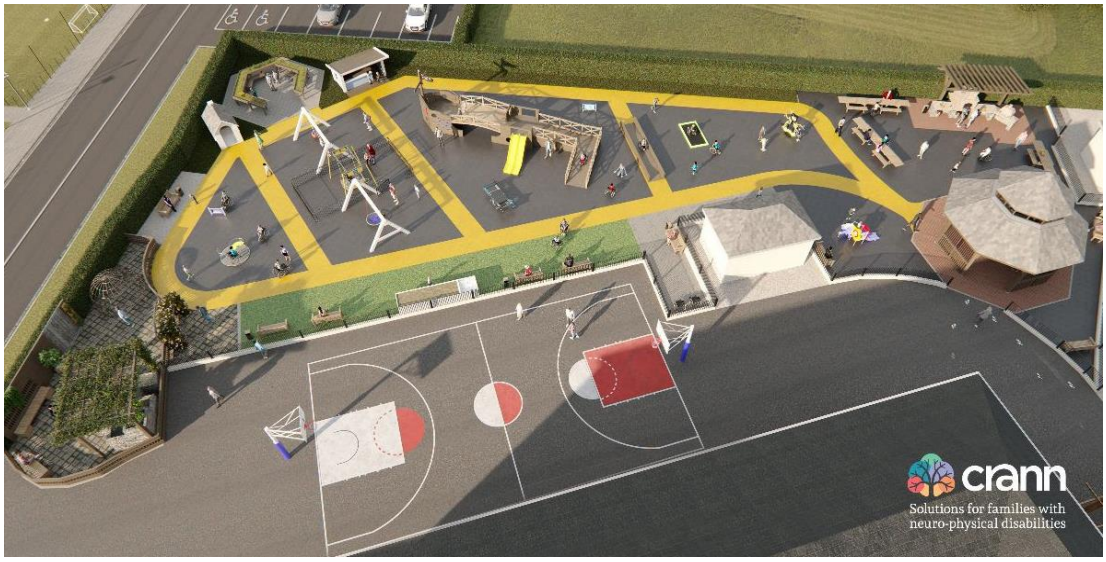


Figure 3: Final plan for the play and recreation space

Once a final plan was agreed, a planning application was submitted to the relevant planning authority for approval. Moreover, RoSPA[61], an independent body that carries out playground inspections to ensure work is carried out to the highest safety standards, reviewed the plans to ensure that the proposed site developments would be approved post-installation. Furthermore, insurance was sought for the new play and recreation space.

Phase Four: Fundraising and construction

What followed the above phases and approvals was a fundraising campaign for €500,000 to construct a purpose-built outdoor play and recreation space. Numerous corporate partners and organisations supported the initiative through donations of money, materials, or volunteering[62]. Moreover, individuals were also invited to get involved in fundraising efforts via donations, "Walk n Roll" 5km challenges, marathons, and Facebook fundraisers, for example.

An Taoiseach Micheál Martin (the prime minister of the Republic of Ireland) turned the first sod in July 2021, following building delays as a consequence of COVID-19 restrictions at the time. The construction spanned a twelve-month period then (June 2020 – July 2020), and numerous volunteers supported the efforts to build the play

[61] https://www.rospa.com/
[62] https://cranncentre.ie/accessible-playground-leisure-area/

and recreation space also. In particular, numerous volunteers supported the build of the purpose-built pirate ship and gazebo.

Helen and I visited the site on numerous occasions during the construction phase to assist with decision making on-site when necessary and oversee the build in general to ensure that the members' needs, wants and desires for the play and recreation space were included.

Phase Five: Delivery and outcome phase

The outcome of this project is a bespoke €500,000 inclusive play and recreation space spanning ¼ acre, that aims to provide something for everyone: from the swings to the bespoke pirate ship, the playhouses to a sensory area, the trampoline to the gym equipment, the carousel to the rockers and music instruments, to the basketball court.

Prior to the official opening, alongside Crann staff, I conducted a trial run of the space with members who had fed into phase two (the research phase) and phase three (the planning and design phase). It was originally planned that this would take place one week prior to the official opening of the play and recreation space (i.e., 25 June 2022). Up to this point the site was a construction site, thus, appropriate permissions and playground safety inspections (RoSPA) needed to be guaranteed before the space could be used, hence the rationale for one-week. However, weather conditions meant that this was postponed until 01 July 2022.

In total, fifteen members contributed (including seven children, three adults, and five parents). Each space and item were tested by members for accessibility, usability, and play value, using a traffic light checklist system. Red indicated that something did not work well, amber indicated that there were some issues, and green indicated that it worked well. After, Crann staff members and I facilitated a large group discussion to establish consensus on what items/ spaces worked well, had some minor issues, and did not work well. Moreover, participants were invited to propose suggestions to improve what was already on offer in the new play and recreation space.

Overall, the children, adults, and families were very happy with the space. They expressed that we had taken on board their ideas at the design phase (e.g., having edges

enclosed) and they could see these ideas implemented in the resulting design. Overall, some comments made were:

"It's better than expected".

"There's something for everyone".

"Amazing"

"Good variety"

"Extremely high finish and excellent quality"

Furthermore, the children, adults, and families highlighted some further primarily low-cost suggestions to further extend the play value already on offer. I subsequently compiled a one-page report and fed this back to Crann staff members, for consideration.

The following day (02 July 2022), the play and recreation space was officially opened by An Taoiseach Micheál Martin and Ann Rabbitte TD who is Minister of State with responsibility for Disability at the Department of Health and the Department of Justice and Equality. The joyous opening event attracted national and local media attention, and was covered on the national news in Ireland, RTÉ[63]. Crann also posted videos on YouTube of the official opening ribbon cutting[64], as well as speeches and presentations[65] at the event.

Crann has recently updated their website to display what's on offer in the play and recreation space[66]. Below are some pictures of the play and recreation space from the opening event (Figure 4).

[63] https://www.rte.ie/news/munster/2022/0702/1308117-inclusive-playground-cork/
[64] https://www.youtube.com/watch?v=hUo8jcoAQ68
[65] https://www.youtube.com/watch?v=0bJtQ42WEjc
[66] See: https://cranncentre.ie/accessible-playground-leisure-area/



Figure 4: Pictures of the play and recreation space from the opening event (Images from the Crann Centre on Twitter and Crann Centre Website)

Impact of the project

As noted in the introduction, this project offers an example of knowledge translation that resulted in a sustainable benefit that impacted numerous stakeholders. Although not an exhaustive list, below are some examples of the impact of this project, to date.

Impact at a personal level for the PhD candidate

In short, the project provided an opportunity for the me to translate knowledge and practice in an innovative manner. Specifically, I had specific knowledge on UD and because of my PhD studies, I was developing an evidence base for the use of UD for playground design; therefore, knowledge derived from my doctoral research served to

underpin this project. Moreover, as a qualified occupational therapist, I possessed an integrated view of the person, occupation, and environment, therefore, I was well positioned to collaborate with the organisation, the design team as well as with users and consumers to achieve the most effective and sustainable design solutions. Moreover, innovation included the use of participatory methodologies, the co-production of knowledge (designing with rather than for), and interdisciplinary and interagency working. Additionally, the project served to further enhance my knowledge (e.g., UD, play, inclusion) and skill sets (e.g., research, writing blogs, participating in media interviews). The project also resulted in engagement with stakeholders nationally and internationally on the topics of play, play space design, inclusion, and knowledge translation (e.g., student supervision; guest lectures; collaboration).

Furthermore, the project also offered chances to expand and promote the Occupational Therapy role in more diverse areas that address context focused therapy provision. In particular, the project offered me an opportunity to explore a potential role as a UD expert in the design and development of play and recreation spaces. As a qualified occupational therapist, I offered unique knowledge to this project as I considered not only person and environment factors, but also the occupations people perform in play and recreation spaces; without such input, there was likely to be a selection of play and recreation items from a catalogue without any translation of needs into play and recreation solutions. Emerging from this project, I confirmed that occupational therapists have a significant role to play, alongside other design professionals, such as designers and landscape architects, to address the entity of play and recreation space design and development more holistically.

Finally, the project offered an opportunity to learn design by doing design, and thus offered more nuanced insights into the complexity of design which served to add further value to the projects that comprise this thesis. Certainly, this project was conducted in a context that lacks national guidelines or practice policy, for example, on how to engage with users, and how to co-design for inclusive play including UD; therefore, it was necessary to figure things out along the way. It is worth noting that this project was not only viewed as an academic pursuit or an opportunity to benefit from a learning experience. Rather, this was a passion project. Indeed, I firmly believe

that research needs to address real-world problems and as such, I was well positioned to address a real-world problem in my local community by using my knowledge in an applied way. While I was involved in numerous collaborations over the course of this doctoral research on the topics of play and inclusion (Appendix A), this project represents a collaboration between Crann, Dr Helen Lynch and I to collaboratively apply knowledge, create new knowledge, and co-design a play and recreation space, hence why it is presented here as an impact case study.

Impact at an international level

At an international level, the research contributes to the growing knowledge base on the relationship between the design of the built environment and people's health, social participation, and attainment of human rights. Specifically, it contributes to an emerging evidence base for using UD in designing play and recreation spaces and offers a real-world example of co-design in action.

Impact at a national level

At a national level, the importance of this work has been highlighted across multiple forums. Specifically, the project was shortlisted by HUB na nÓg (a national centre of excellence and coordination on giving children and young people a voice in decision-making) as an example of good practice for involving children and young people in decision-making. Moreover, in May 2022, the project was awarded the most prestigious Occupational Therapy award in Ireland, the National Association of Occupational Therapists of Ireland (AOTI) Ann Beckett Award[67], which aims to highlight valuable and innovative work by occupational therapists.

Furthermore, the importance of the project was acknowledged by An Taoiseach Micheál Martin, whereby he visited the site to turn the first sod (July 2021), and officially opened the play and recreation space (July 2022). Both visits were covered by national and local media (See Appendix J). Finally, following a recent visit to the site, Ryan Tubridy on his national Radio programme on 13 July 2022, noted:

[67] See: https://www.aoti.ie/about-us/Ann-Beckett-Award

"… I will never forget visiting that playground because it had such an impact; it's such a fair, equal, decent, and as I said yesterday, democratic playground. Loved it"[68].

Impact at a service level

The organisational buy-in and increased capacity following engagement with external stakeholders has meant that this project will have lasting effects for the planning of policy, services, or programmes in Crann, and indeed, beyond Crann. Via this project, seldom heard people (i.e., people with disabilities and their families) were meaningfully engaged in participatory research to ensure that they were listened to and involved in decision-making for the new play and recreation space at Crann.

Moreover, the outcome of the project serves to expand the suite of services already offered by Crann, which have been highlighted at local events (e.g., Through the looking glass – Play and inclusion conference, Cork, March 31, 2022). For example, the BBQ area and pizza oven will offer crucial food preparation skills, while the raised planter areas will be a space to learn horticulture skills like growing vegetables and flowers, all of which are important independent living skills. Also, with the vast array of opportunities for wheeling, the wheelchair skills programme can also be extended in a more naturalised context. Finally, enhanced community networks have been fostered through volunteering efforts, fundraising efforts, and corporate sponsorships for the play and recreation space.

Impact at a member level

Via this project, the wider team and I had an opportunity to meaningfully engage with seldom heard people and the bespoke play and recreation space means that Crann members have enhanced opportunities to participate and engage in play and recreation occupations. Prior to opening, members confirmed:

"I am looking forward to playing with my friends" (Child[69])

[68] https://www.rte.ie/radio/radio1/ryan-tubridy/programmes/2022/0713/1309950-the-ryan-tubridy-show-wednesday-13-july-2022/
[69] https://www.facebook.com/watch/?v=199548289037219

> "I will no longer have limits and barriers to outdoor play, this project is one that will change my life forever" (Teenager[70])
>
> "It will be fun and laughter for all at the Crann Centre where no one is excluded" (Adult[71])
>
> "Speaking with the Crann team and the UCC researchers, Helen and Alice, was the first opportunity that we, as a family, had a say in something that was being designed for families like us" (Parent[72])

Furthermore, following the official opening of the play and recreation space, members confirmed:

> "Now I'm able to go on it and it's just amazing to enjoy and actually just do it as other people can" (Teenager[73])
>
> "This playground isn't just for kids; us adults are having fun too" (Adult[74])
>
> "… the pirate ship is a ship of dreams; our family feel so privileged to finally be able to bring our eight-year-old [name of child] to such a safe and accessible playground …" (Parent[75])

As the play and recreation space has only recently opened for use, going forward, it will be essential to evaluate the impact of the space. I have also committed to supporting evaluation projects in the future.

Impact at an institutional and departmental level

As this project was supported by a staff member (Helen) and a student (myself) from the Department of Occupational Science and Occupational Therapy in University College Cork, Ireland, the project has presented several opportunities. Specifically, the project offers an example of how the University can support and respond to real-world problems in our communities. Moreover, the project was awarded the most prestigious Occupational Therapy award in Ireland, the National Association of

[70] https://cranncentre.ie/all-i-wanted-was-to-be-able-to-play-like-any-human-being-and-that-option-just-wasnt-possible-hannahs-perspective/
[71] https://www.facebook.com/watch/?v=597972381278185
[72] https://cranncentre.ie/maeve-brendans-story-2/
[73] https://www.rte.ie/news/munster/2022/0702/1308117-inclusive-playground-cork/
[74]https://twitter.com/CrannCentre/status/1547216899636871168?s=20&t=84_l6WQgEy3klUaM88lCsw
[75] https://www.rte.ie/radio/radio1/ryan-tubridy/programmes/2022/0713/1309950-the-ryan-tubridy-show-wednesday-13-july-2022/

Occupational Therapists Ireland Ann Beckett Award, highlighting both the institution and the department.

At a departmental level, the project has resulted in engagement with stakeholders nationally and internationally on the topics of play, play space design, inclusion, and knowledge translation (e.g., student supervision; guest lectures; collaboration). Also, Helen and I co-supervised an undergraduate student on a summer research internship programme in 2020, who assisted on this project. Furthermore, the play and recreation space will provide opportunities for final year undergraduate students to evaluate the space as part of their final year research projects in 2022/2023.

Plan for going forward

Going forward, Helen and I plan to honour our commitments to Crann to evaluate the success of space now and into the future. Thus far, two final year undergraduate projects are planned for the coming academic year to evaluate the space from the perspectives of child and adult users. I will supervise these projects, and further projects will follow in the future.

Limitations

As with all projects and research studies, there are some acknowledged limitations. Firstly, the small sample size for the electronic questionnaires and online focus group discussions is a limitation. Second, conducting the focus groups for phase two of the research is a limitation; however, this project was conducted in the context of COVID-19, thus, this research had to be conducted online to ensure safety. Finally, completing the trial run one day prior to opening was a limitation; again, this was a consequence of requiring the appropriate approvals to access the site and weather conditions at the time.

Conclusion

In sum, this project offers an example of how to include “user experts” alongside “professional experts” when planning, designing, and providing an inclusive play and recreation space that everybody can access, use, and feel welcome. Knowledge derived from this project can serve as a blueprint for other communities that wish to plan, design and/or renovate new or existing public playgrounds. It is a model for what

inclusive outdoor play and recreation can really look like once “user experts” are consulted and included by “professional experts” in co-designing play and recreation spaces. Moving forward, and in line with good practice, co-design approaches must be considered the norm rather than the exception for inclusive playground design and provision.

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Chapter Nine: Conclusion

Introduction

In this concluding chapter a summary of the main findings from the five studies that comprise this thesis is presented; a description of the new understandings the data reveals and the contributions that the study may have to the current understandings of using Universal Design (UD) for public playground design from a higher conceptual level as well as an applied level are outlined. A general discussion on a novel concept that emerged from the findings of the studies that comprise this thesis, that is, UD for Play (UDP), is offered. Further, the strengths and limitations of the overall research design are outlined and followed by a critical analysis of the overall contribution of this doctoral research. Furthermore, implications for research, policy, and practice are identified. Finally, priorities and directions for future research are set out as it relates to public playground design and play value.

Summary of main findings

As previously noted, this doctoral research was underpinned by a human/child rights-based approach and is also an occupational science study adopting a Person Environment Occupation (PEO) model (Law et al., 1996) that considers play for the sake of play as fundamental to a good childhood, in the context of transactional understanding of how the fit between person and environment maximises the potential occupation of play that can happen in public playgrounds. Therefore, informed by an occupational perspective of play as an occupation, and the requirement to provide universally designed built environments for play from an occupational and human/child rights perspective, the overall aim of this thesis was to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level.

Therefore, the scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD and includes five studies that reviewed published and grey literature as well as explored the perspectives of "professional experts" and "user experts". Overall, this doctoral research contributes an evidence base for using UD for public playground design; specifically, this thesis contributes a detailed analysis of existing published and grey literature and contributes new data

from “professional experts” and “user experts”. Nevertheless, although the UD concept is widely endorsed, there remains ambivalence around what UD is trying to achieve. Indeed, while person and environment factors of the PEO model were broadly considered across the studies, the interaction between a person, the environment, and their occupations is largely overlooked. Subsequently, the outcome of inclusion and enabling participation in play occupation in public playgrounds is ambiguous. Therefore, findings from this thesis established the need for a tailored perspective of the UD concept to include play occupation as a central concern (UD for Play [UDP]). However, before identifying potential solutions, it is important firstly to summarise each of the five studies that comprise this thesis; these are presented below.

The first scoping review study (**Study I, Paper I**) aimed to review evidence for using UD in public playground design. Specifically, this study aimed to identify and synthesise what is known from published, peer reviewed studies about inclusive public playgrounds, underpinned by a commitment to understanding the concept of UD. Fifteen studies published between 1999 and 2019 met the inclusion criteria for this review. Findings highlighted the utility of UD in underpinning the design of public playgrounds across many practice and research contexts; however, the evidence is currently very sparse. Although many studies included UD in their discussion or findings, it was more an aspirational or vision issue rather than applied issue. Consequently, the evidence for the process of implementing and/or measuring the outcomes of UD is lacking and therefore, the outcome of inclusion and enabling participation in play occupation in public playgrounds is ambiguous. Therefore, it is not yet known whether UD can support outdoor play, social participation, and inclusion in public playgrounds, because of a lack of evidence. Moreover, numerous terms are all being used to describe non-discriminatory planning and design processes, which has led to inconsistency and confusion. Therefore, it was established that there was a need for further research to consolidate the evidence base for using Universal Design (UD) for public playground design (Chapter Three), hence the emergence of Study II.

The second scoping review study (**Study II, Paper II**) aimed review the conceptual understanding of UD in public playground design. Specifically, this study aimed to examine how UD, and related non-discriminatory planning and design concepts, have

been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion. Fifteen studies published between 1999 and 2019 met the inclusion criteria for this review. Analysis revealed that experts used the terms UD, inclusive design, accessibility, and usability to describe non-discriminatory planning and design processes indiscriminately and without regard for higher or lower order concepts, which has potentially led to inconsistency and confusion. Altogether, diverse interpretations of UD were evident showing inconsistent application of international frameworks, such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (United Nations [UN], 2006). For some accessibility was emphasised as an end rather than a means and consequently UD was largely considered from an accessibility rather than an outcomes point of view, for others, UD was understood as a more holistic concept in terms of designing for inclusion. Nevertheless, findings highlighted the utility of UD in underpinning the design of public playgrounds across many practice and research contexts as numerous related non-discriminatory planning and design concepts were evident, consistent with supporting outdoor play, social participation, and inclusion in public playgrounds. However, from the findings, it is evident that the UD concept requires further clarity and specificity as it pertains to playground design and inclusion in outdoor play (Chapter Four). Therefore, further research to establish an evidence base for UD as it pertains to the outcome of inclusion and enabling participation in play occupation in public playgrounds is required.

The third and final scoping review study (**Study III, Paper III**) sought to synthesise what is known from international grey literature guidelines for the design of public playgrounds for inclusion, and examine the design approaches, design principles, and design recommendations within these guidelines. Twenty-seven guideline documents met the inclusion criteria for this review; twenty-four of these guideline documents were published between 2003 and 2020, the remaining three guideline documents did not list their date of publication. Analysis revealed that UD lacked consistent use in guidelines for practice; the utility of UD was potentially undermined as the seven principles (Connell et al., 1997) and eight goals (Steinfeld & Maisel, 2012) of UD were not prevalent across guideline documents despite the endorsement of UD as a design approach internationally (e.g., Committee on the Rights of Persons with Disabilities [CRPD], 2014; Committee on the Rights of the Child [CRC], 2013; UN,

2006). Moreover, multiple design approaches were used to describe non-discriminatory planning and design processes and numerous design principles were formulated to describe the concept of designing for inclusion. Additionally, diverse design recommendations as they pertain to play value and inclusion were proposed. Despite the variability among the guidelines, and although UD was not always considered, the core concept of inclusion underpinned all guideline documents. Nevertheless, the interaction between a person, the environment, and their occupations is largely overlooked; still, given that achieving inclusion is a defining feature of UD, from the findings, it is apparent that UD may be considered to have utility in underpinning the design of public playgrounds (Chapter Five).

The first empirical study (**Study IV, Paper IV**) included a descriptive cross-sectional, online survey study that examined, for the first time in Ireland, the ways in which UD is understood and implemented by a national sample of playground professionals (i.e., those that plan, design, and/or provide public playgrounds). Thirty-six playground professionals from all provinces in the Republic of Ireland completed the online survey. Numerous disciplines were represented in this study and analysis revealed that playground professionals acknowledge the importance of UD and implement UD in several ways. However, significant barriers to implementing UD included a lack of knowledge and good practice guides for embedding UD. Because of a lack of knowledge on UD, it was subsequently not utilised at an applied level. Therefore, evidence for the process of implementing and/or measuring the outcomes of UD is lacking and consequently, the outcome of inclusion and enabling participation in play occupation in public playgrounds is unclear. To counteract these barriers, a variety of opportunities, initiatives and training prospects were identified. Still, from the findings, it is evident that further international research with "professional experts" and "user experts" is required to strengthen knowledge on socio-spatial inclusion (Chapter Six).

The second and final empirical study (**Study V, Paper V**) included a qualitative descriptive study that sought to explore the experiences of using playgrounds, as well as the reasons for non-use, from child and adult perspectives, through the lens of play and play value to inform UD. Findings emphasised that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion,

playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. Nevertheless, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion. Therefore, for UD to fully realise its potential in underpinning the design of public playground for inclusion, it is essential that public playgrounds are co-designed and co-created with user experts and professional experts (Chapter Seven).

In sum, findings from the five studies that comprise this thesis established an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level, in many developed countries. Nevertheless, while the UD concept is widely endorsed, the outcome of inclusion and enabling participation in play occupation in public playgrounds is unclear. Specifically, the evidence for the process of implementing and/or measuring the outcomes of UD is lacking, it lacked conceptual clarity among experts, it is largely considered from an accessibility rather than an outcomes point of view, it lacked consistent use in guidelines for practice, and the evidence confirmed the lack of knowledge among playground professionals.

Moreover, and as previously noted, while person and environment factors of the PEO model (Law et al., 1996) were broadly considered across the studies, there remains ambivalence around what UD is trying to achieve. Indeed, the interaction between a person, the environment, and their occupations is largely overlooked and subsequently, the outcome of inclusion and enabling participation in play occupation in public playgrounds is ambiguous. Still, Watchorn and colleagues (2021) articulated that "if UD is intended as a means for increasing social inclusion and wellness it cannot be limited to personal and environment determinants"; they articulate that for UD "to reach its stated goals, the discourse around UD must be more inclusive of the occupations people participate in …" (p. 11). Specifically, occupational therapists have been identified as a discipline who already possess an integrated view of the person, occupation, and environment (Hitch et al., 2012), therefore, the ongoing development of UD for public playground design for inclusion could be enhanced

through the involvement of disciplines beyond those traditionally involved in the design of the public playgrounds (including occupational therapists).

Nevertheless, and echoing findings from Watchorn and colleagues (2021), findings from the studies that comprise this thesis emphasise that enlarging the discourse around UD to include a focus on occupational and social participation, multi- and trans-disciplinary collaboration (within and outside the professional realm), as well as multicultural perspectives, are required to enable the concept to reach its full potential as a medium for social justice (Watchorn et al., 2021). Additionally, this thesis argues for further conceptual refinement to consolidate the importance and future application of UD for Play (UDP) in the design of public playgrounds that promote outdoor play (with high play value), social participation, and inclusion; UDP is described below.

General discussion on Universal Design for Play (UDP)

Emerging from the studies that comprise this thesis was a novel concept, that is, UD for Play (UDP). For this part, how the UDP concept came about and evolved over the course of the studies will be identified. Then, the potential contribution that this concept makes to the body of research on public playground design for inclusion, will be considered. Finally, suggestions on how the UDP concept can potentially be developed to enhance its usefulness are set out.

UDP: How did the concept come about and evolve?

Overall, this doctoral research was guided by a theoretical framework from the discipline of occupational therapy, that is the PEO model that describes the dynamic interaction that occurs between a person, their environment, and their occupations (Law et al., 1996). Additionally, this doctoral research was guided by fundamental occupation-focussed theoretical concepts that meaningful engagement and participation in occupations, is associated with improved quality of life (Bedell et al., 2011; Coussens et al., 2020; Law, 2002; Law et al., 2011; Moore & Lynch, 2018; Rodger, 2010), increased social competence (Khetani et al., 2012; Mahoney et al., 2003), greater development of self-identity (Bedell, 2012) and better educational success (Bedell, 2012; Simeonsson et al., 2001).

From this perspective, children's meaningful engagement and participation in play occupations, provides satisfaction and joy, promotes quality of life, and makes children happy (Coussens et al., 2020; Moore & Lynch, 2018). In addition, this doctoral research was guided by play as a fundamental human right of all children as described in Article 31 of the United Nations Convention on the Rights of the Child (UNCRC) (UN, 1989), and therefore the need to create inclusive built environments that support all children's meaningful engagement and participation in play occupation, so that all children can enjoy their rights contained within Article 31 and the associated benefits of participating in play occupation. Internationally, UD was endorsed as the way forward, yet the evidence base was very sparse. Thus, the aim of this thesis was to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level.

Yet, as previously noted, Watchorn and colleagues (2021) recently conducted an integrated literature review of the current discourse around UD and built environments. They found that the discourse around UD in the built environment address the person and environment components of the Person Environment Occupation (PEO) framework (Law et al., 1996; Watchorn et al., 2021). Nevertheless, the goals of UD in the built environment are prefaced on the aim to enable and empower a diverse population by improving human performance, health and wellness, and social participation (Steinfeld & Maisel, 2012). Therefore, for UD to reach its stated goals the discourse cannot be limited to personal and environment determinants only; rather, a focus on occupational and social participation needs to be incorporated also (Watchorn et al., 2021).

Nevertheless, several researchers have identified that the application of UD for playgrounds is particularly problematic when considering the need to design for play (Casey, 2017; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018). As noted in Chapter One, Theresa Casey, an internationally renowned consultant on children's play and playground design, reviewed UD principles three (simple and intuitive use) and six (low physical effort) and identified that "the principles of low physical effort and simple and intuitive use may be deemed to confound the desire for play features requiring progressive levels of physical exertion or offering intrigue and surprise" (Casey, 2017, p. 371). In this way, Casey (2017)

emphasises the requirement to provide for challenge in children's play, but also highlights the challenges inherent in designing a specific solution than can challenge everyone and accordingly support their progression. On foot of this critique, efforts were made to translate and tailor the principles of UD for playgrounds from occupational therapy and occupational science perspectives (Lynch et al., 2019; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018).

Moreover, as noted, person and environment factors of the PEO model (Law et al., 1996) were broadly considered across the studies, however, there remains ambivalence around what UD is trying to achieve. Indeed, the interaction between a person, the environment, and their occupations is largely overlooked and subsequently, the outcome of inclusion and enabling participation in play occupation in public playgrounds is ambiguous. Nevertheless, because this doctoral research considered the use of UD for public playground design, there was a need to consider not only person and environment factors, but also consider what people do in these spaces (i.e., play), considering critiques presented previously (Casey, 2017; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018). Consequently, findings from the scoping review studies confirmed that further efforts were required to consider how the principles of UD can be tailored to include play occupation as a central concern as it relates to public playground design for inclusion. This ultimately led to the development of a novel concept, that is, UD for Play (UDP). Indeed, the foundations for UDP concept can be traced to the first scoping review study that set the scene for tailoring the UD concept (including its principles and goals) to include play as a central concern; this is explained below. Moreover, the UDP concept was further developed in the two scoping review studies that followed; this is further described below.

In the first scoping review study (**Study I, Paper I**) of the PhD discussed that the application of UD for playground design was particularly problematic when considering the need to design for play (Casey, 2017; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018). While it was acknowledged that efforts had been made to translate and tailor the principles of UD for playgrounds from occupational therapy and occupational science perspectives (Lynch et al., 2019; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018), findings from this review revealed that further efforts were

required to consider how the principles of UD can be tailored to include play occupation as a central concern as it relates to public playground design for inclusion.

On foot of this review, the second scoping review study (**Study II, Paper II**) further acknowledged the need to further enhance understanding of how UD can be utilised to enhance play in public playground design. It was suggested that in the same way UD had been tailored for learning approaches aiming to meet the needs of all students (UD for Learning/UDL) (Burgstahler, 2020), UD could potentially be tailored for play to meet the needs of all children. It was at this point that the novel concept emerged, that is, UDP, to potentially enlarge the discourse on UD to include play as a central concern when designing built environments for play occupation.

Following this, the third scoping review study (**Study III, Paper III**) focused on grey literature guidelines for implementing good design for playgrounds and therefore UDP was further examined as it applies to implementing play solutions for inclusion. Findings from this review identified that to fully realise the design of public playgrounds for inclusion, UD may need to be tailored for play (UDP) in the same way it has been tailored to ensure equity of teaching and learning in inclusive education (UD for Instruction/UDI) (Burgstahler, 2009). It was proposed that in the same way UD had been tailored to ensure equity of teaching and learning in inclusive education (UDI), a similar approach could potentially be adopted to consolidate the importance of and future application of UDP. Specifically, it was asserted that UD could/should be integrated with play value so that it can be applied to the overall design of inclusive public playgrounds as well as specific playground components, terrain, and facilities.

In sum, the UDP concept is a novel concept that emerged from and developed across the scoping review studies that comprise this thesis. While there is clear acknowledgement of the potential of UD across these scoping review studies, an articulation of how the application of UD for public playground design ensures inclusion in play is lacking. Therefore, the UDP concept attends to these knowledge gaps and sets out a potential proposal for creating well-designed public playgrounds that successfully integrate the needs of all children. It moves beyond minimum accessibility standards and considers usability and inclusivity factors also alongside

play and play value, so that all children are a part of the overall play experience. As a relatively new concept, however, it is important to consider first, the potential contribution that the UDP concept makes to the body of research on public playground design for inclusion, with particular emphasis on the use of UD for public playground design given the overall aim of this thesis. Then, it is important to consider how the concept can potentially be progressed to enhance its usefulness for public playground design for inclusion. The following sections will discuss these two considerations.

UDP: What contribution does the concept potentially make?

As noted, UDP is a novel concept that emerged as a direct consequence of the scoping review studies that comprise this thesis. Informed by research needs and priorities identified by Watchorn and colleagues (2021), the studies that comprise this thesis progress the current discourse on UD in built environments. As public playgrounds are important built environments for outdoor play, social participation, and inclusion, the research was not limited to considering personal and environment determinants only. Rather the studies that comprise this thesis also considered the occupations people perform in public playgrounds, that is, play. In doing so, the studies that comprise this thesis progress the current discourse on UD in built environments by considering the occupations people perform in these spaces.

Moreover, the first scoping review study (**Study I, Paper I**) determined that the current evidence on public playground design for social participation and inclusion had not yet been explored in relation to the use of UD for public playground design from a higher conceptual level as well as an applied level. Therefore, the UDP concept potentially extends research on public playground design for inclusion, by specifically considering the applicability of UD for public playground design. Indeed, across the studies that comprise this thesis, UD is recognised to have potential for underpinning the design of public playgrounds that support outdoor play, social participation, and inclusion. However, the second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies specifically emphasise that for UD to realise its potential for public playground design, it potentially needs to be tailored to include play as a central concern (UDP) in the same way UD was tailored to ensure equity of teaching and learning in inclusive education (UDI/ UDL).

Furthermore, the UDP concept potentially further contributes to research that has already been put in motion by occupational therapists and scientists to tailor the principles of UD (Lynch et al., 2019; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018). While these researchers have attempted to include play as a central concern, the UDP concept potentially establishes a more formalised way to further develop this work. Indeed, findings from the third scoping review study (**Study III, Paper III**) specifically suggested the need to seek guidance from already established frameworks for applying UD principles to learning environments (i.e., UDI). Three sets of principles underpin UDI and can be applied to the overall design of instruction as well as to specific instructional materials, facilities, and strategies (Burgstahler, 2009). Thus, a similar approach could potentially be adopted to consolidate the importance and future application of UD for Play (UDP) to better support the overall design of inclusive public playgrounds that incorporate UD and play value principles.

Overall, the UDP concept has potentially contributed to the discourse on UD in built environments. In particular, the studies that comprise this thesis progress the current discourse on UD in built environments by considering the occupations people perform in built public playground environments. Moreover, the UDP concept potentially extends research on public playground design for inclusion. The UDP concept specifically establishes a need to tailor UD to include play as a central concern; indeed, findings from the studies suggest that guidance and support could potentially be sought from already established frameworks that have tailored the UD principles (i.e., UDI). It is further proposed that the UDP concept has the potential to support all children's meaningful engagement and participation in play occupation, by underpinning the design of inclusive public playgrounds. Nevertheless, and despite its strengths, the UDP concept is relatively new; therefore, efforts to potentially develop the concept further are required. A framework for potentially applying the concept is presented next, before identifying suggestions to develop the concept further.

UDP: Is there a framework for applying the concept?

Underpinned by findings from these studies, Figure 1 presents a framework of how the concept could potentially be applied when planning, designing, and providing public playgrounds. Presented as a framework with two pressing concepts at either end, the framework is underpinned by three central tenets, they are, UDP, the need to

include “user experts” and “professional experts”, and the requirement to optimise person, environment, occupation (PEO) fit. UDP and PEO bookend the framework at each end. The central placing of “user experts” (including diverse users and non-users) and “professional experts” (including multidisciplinary professionals) acknowledge the central role that these groups could potentially play when planning, designing, and providing public playgrounds to establish what is needed as well as evaluate what is provided.

Moreover, guided by a framework conceptualised by colleagues in New South (Can I get there, Can I play, Can I stay?) (New South Wales [NSW] Government, 2019), three core questions are asked, as they relate to different aspects of public playground design. The first question is can I get there? This relates to the location, layout, and accessibility of the playground. The second question is can I play there? This refers to the objects and environments for play within the playground. The final question is can I stay there? This concerns the support features within and around the playground. To answer these questions, there is a fundamental need to include “user experts” alongside “professional experts”; including users alongside professionals has been advocated by other researchers in the context of supporting sustainable user participation (Jansson, 2015; Jansson & Persson, 2010; Jansson et al., 2019; Sundevall & Jansson, 2020).

This reflects the requirement to incorporate co-design approaches that position communities at the heart of the design process when planning, designing, and/or renovating new or existing public playgrounds; such processes would also align with international conventions that prescribe public participation in planning and management (Council of Europe, 2000; UN, 1998). Furthermore, in the three subfolders, across all aspects of public playground design, there is a need to optimise accessibility, usability, and inclusivity as well as provide for choice and autonomy. Moreover, for the objects and environments for play, there is a need to optimise play value and provide for graduated challenge.

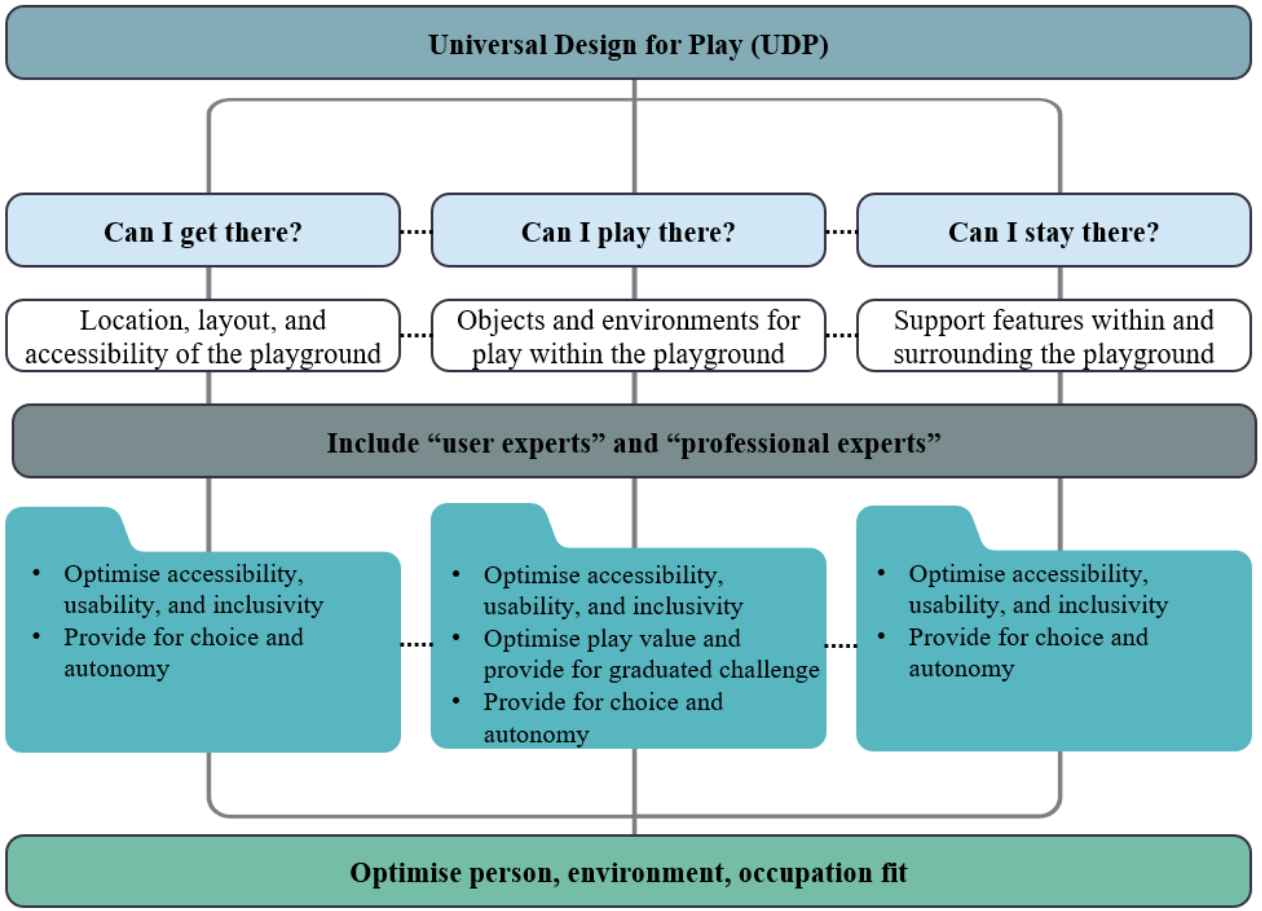


Figure 1: How the Universal Design for Play (UDP) process could potentially be applied when planning, designing, and providing public playgrounds

Overall, the dashed linked lines represent how every element is inextricably interlinked; therefore, there is a need to view the entire framework in a holistic manner, so that all aspects of public playground planning, design, and provision are considered. As is evidenced from the framework, fixed design solutions are not offered to reflect the necessity of involving "user experts". Thus, UDP is not a single design solution that everybody can use but rather UDP could potentially offer a plethora of design solutions that enables everybody to choose a solution that fits as no one size fits all. Despite this important first step to develop a framework to communicate how the concept could potentially be applied, the concept is relatively new. Therefore, further work is required to develop the concept further; potential suggestions for developing the concept are highlighted next.

UDP: How can the concept be further developed?

To enhance the usefulness of the UDP concept, several potential suggestions could be considered. Although the UDP concept was not originally articulated in the first scoping review study (**Study I, Paper I**), findings from this review suggested that multi- and trans-disciplinary collaboration would be required to enlarge the discourse on UD as it applies explicitly to playgrounds. Subsequently, in the second scoping review study (**Study II, Paper II**) findings from this review articulated that multi- and trans-disciplinary collaboration (within and outside the professional realm), and the inclusion of multicultural perspectives (from the global south and global north) is required to enhance how UD is defined, understood, and applied in strategic planning for public playgrounds, from a UD for Play (UDP) perspective.

Following this, in the third scoping review study (**Study III, Paper III**) findings from this review determined that to progress UDP, UD could potentially be integrated with play value in a way that it can be applied to both the overall design of inclusive public playgrounds and to specific playground components, terrain, and facilities. Therefore, multi- and trans-disciplinary collaboration (within and outside the professional realm), the inclusion of multicultural perspectives (from the global south and global north), and the integration of UD and play value is required to progress the UDP concept. As the UNCRC (UN, 1989) is the most widely ratified treaty in history, the incorporation of multicultural perspectives is required to determine how UDP can support and underpin public playground design for inclusion across continents and cultures.

However, while an important first step, developing a framework with principles is not enough; as noted previously, there is also a need to develop guidelines that can be used when implementing UDP. These guidelines would potentially need to offer a set of suggestions on how the concept can be practically implemented when planning, designing, and/or renovating new or existing public playgrounds. This is not to say that there is one right way to implement UDP when planning, designing, and/or renovating new or existing public playgrounds as no one size fits all. Rather UDP is not a single design solution that everybody can use but rather UDP could potentially offer a plethora of design solutions that enables everybody to choose a solution that fits. As such, the aim would be to offer practical set of suggestions to improve and optimise how UDP is potentially implemented in public playground design for inclusion with specific consideration for UD, play, and play value. As noted, developing such guidelines would require research that includes multi- and trans-disciplinary collaboration (within and outside the professional realm) to reach consensus on what such guidelines could/should include. Also, as identified previously, there is a need to include multicultural perspectives (from the global south and global north) to ensure that the concept is not developed and practised with little regard for, or sensitivity towards, socio-cultural variations, or the specific, localised understandings about what appropriate design is or could be (Imrie, 2012).

Finally, occupational therapists and occupational scientists could potentially play a significant role in developing the concept as their knowledge of impairments, age, and disability and fundamental for understanding what specific design solutions are best suited to whom (Moore & Lynch, 2015). However, while occupational therapy practitioner's individual and therapeutic perspectives are of critical importance (Lid, 2014), researchers have noted that enlarging the discourse around UD as it applies explicitly to playgrounds, will require a focus on multi- and trans-disciplinary collaboration, both within and outside the professional realm (Lynch et al., 2020). Moreover, as noted, multicultural perspectives, that reflect sociocultural disability-based understandings are necessary to enable the UD concept to reach its full potential as a medium for social justice (Lynch et al., 2020; Watchorn et al., 2021).

Strengths and limitations of the research design

This thesis has several strengths, and thus, makes a novel contribution to the body of research on public playground design for inclusion and the use of UD from a higher conceptual level as well as an applied level. The three scoping review studies and two empirical studies that comprise this thesis each made an original contribution to knowledge development concerning public playground design for inclusion and the use of UD. Specifically, the three scoping review studies each make an original contribution to knowledge development, and together laid a clear foundation for the two empirical studies that followed. Moreover, the two empirical studies provide new data on from the perspectives of "professional experts" and "user experts". Nonetheless, even though measures were embedded throughout to establish validity for the findings of the studies that comprise this thesis, there are some acknowledged limitations that must also be considered in evaluating this thesis. While strengths and limitations of each of the five studies that comprise this thesis are considered in their respective chapters, key strengths and limitations are reiterated here, to inform future research.

Scoping review studies

The first scoping review study (**Study I, Paper I**) was a state-of-the-art review that comprehensively situated this thesis within international literature. Specifically, no date limitations were placed on the search, and thus, all available peer reviewed literature on inclusive public playgrounds was identified and synthesised in relation to physical design features and non-physical design aspects that facilitate or hinder outdoor play, social participation, and inclusion in public playgrounds. Moreover, this review contributed important information regarding the use of UD in the context of reviewing design recommendations and specific design approaches.

The second scoping review study (**Study II, Paper II**) narrowed its focus to explicitly examine how UD, and related non-discriminatory planning and design concepts, have been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion. While UD has been the focus of research pertaining to public playgrounds, this scoping review study was the first of its kind to provide a comprehensive analysis of how UD and related design concepts are represented amongst playground researchers internationally. Moreover, this study

argued for further multi- and trans-disciplinary collaboration to consolidate the importance and future application of a new concept, UD for Play (UDP), in the design of public playgrounds that promote outdoor play, social participation, and inclusion. In doing so, this scoping review study makes a substantial contribution to the discourse around play provision and designing for inclusion and identified a concept that served to underpin this thesis.

Furthermore, the third scoping review study (**Study III, Paper III**) broadened the lens beyond peer reviewed academic literature and synthesised what is known from international grey literature guidelines for the design of public playgrounds for inclusion. Specifically, scoping review search methods were developed and applied to conduct a scoping review of grey literature guidelines; this systematic analysis of grey literature guideline documents was the first of its kind to provide a broad understanding of how design approaches, principles, and recommendations for designing public playgrounds for inclusion are conceptualised and discussed in guidance documents in many international contexts. The review and subsequent discussion highlight that although UD is recognised to have the potential to support the design of public playgrounds, inconsistent design approaches, principles, and recommendations, were communicated among the included guideline documents, suggesting an inconsistency and confusion between approaches, principles, and application. Consequently, this scoping review study laid a clear foundation for the empirical study that followed, in terms of determining pertinent questions for playground professionals in terms of their understanding and implementation of UD.

Collectively, these three scoping review studies each make an original contribution to knowledge development concerning public playground design for inclusion and the use of UD, and together laid a clear foundation for the two empirical studies that followed. Nonetheless, there are some acknowledged limitations. Explicitly, across all three scoping review studies, several criteria were put in place that excluded potentially relevant peer reviewed articles of grey literature guideline documents. Moreover, double coding was led by the PhD candidate because of resource limitations, which limits the reliability of the findings. Additionally, each of the reviews were limited to articles or guideline documents published in the English language; consequently, evidence published in other languages may have been missed.

Furthermore, while a range of disciplines and perspectives are evident in the scoping review studies, the discourse presented in the findings is from several developed countries, which raises the question of representation. To address these limitations, future research that addresses specific aspects is warranted. Future research directions are outlined in each of their respective chapters in this thesis (see Chapters Three, Four, and Five), and further considered later in this chapter.

Empirical studies

The first empirical study (**Study IV, Paper IV**) provides new data on the ways in which UD is understood and implemented by a national sample of playground professionals in the Republic of Ireland. The bespoke survey instrument was informed by UD experts from the Centre of Excellence in UD (CEUD) in Ireland and offered a window to explore the ways in which UD is understood and implemented by "professional experts". It was the first survey of its kind to target a national sample of playground professionals in the Republic of Ireland and thus, provides national data that may aid the identification of national and local priorities to better support the implementation of UD for public playground design for inclusion. Furthermore, as the use of UD for public playground design is promoted in the international context, this study potentially paves the way for further studies in international contexts with playground professionals that can further add to our understanding of the ways in which UD is understood and implemented by "playground experts".

The second empirical study (**Study V, Paper V**) provides new data from the perspectives of children and adults regarding their experiences of using playgrounds, as well as the reasons for not using playgrounds. Data from this study demonstrated that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. Nevertheless, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion. Moreover, the adoption of a framework developed by colleagues in New South Wales (Can I get there? Can I play? Can I Stay?) (NSW Government,

2019) to frame the findings contributes to the identification of ideas, from the perspectives of children and adults, to support public playground design for inclusion. Additionally, this study used a three-stage qualitative descriptive design, and potentially paves the way for further studies in national and international contexts with "user experts" that can add to our understanding of how UD can be implemented in a practical way so that families can access, use, be included, and participate in play occupation in public playgrounds. Furthermore, this study contributes an Irish perspective to the growing international body of knowledge on public playground design for inclusion, from the perspectives of "user experts".

Together, these two empirical studies provide new data on from the perspectives of "professional experts" and "user experts". Nevertheless, there are some limitations which impact upon the extent to which the results can be generalised. Indeed, both empirical studies were limited by way of their relatively small sample size. Moreover, for the first empirical study (**Study IV, Paper IV**), the fact that participants only contributed to an online survey can be considered a limitation as a follow-up interview may have provided more in-depth nuanced insights that were not adequately captured in the survey. Furthermore, for the second empirical study (**Study V, Paper V**), the fact that the participants were only interviewed once can be considered a limitation since a second interview may have added further information on the issue. Furthermore, individual interviews, instead of group discussions, may have made it possible to examine and compare the views of individual children and adults. To address these limitations, future research that addresses specific aspects is warranted. Future research directions are outlined in each of their respective chapters in this thesis (see Chapters Six and Seven) and are further considered later in this chapter.

Rationale for three scoping review studies

As previously noted, researchers have determined that scoping reviews are invaluable for synthesising research evidence (Arksey & O'Malley, 2005; Pollock et al., 2021), especially when a body of literature has not yet been comprehensively reviewed, or exhibits a large, complex, or heterogeneous nature not amenable to a more precise systematic review (Peters et al., 2015). Although scoping reviews have faced criticisms for its methodological approach for synthesising evidence (e.g., Davis et al., 2009; Tricco et al., 2016), Arksey and O' Malley (2005) identified that scoping review

studies are particularly useful for evidence-based practice as they examine broad areas, clarify key concepts, and report on the types of evidence that address and inform practice in the field. Additionally, scoping review studies can identify gaps in the research knowledge base, and consequently, can inform the development of future research endeavours (Khalil et al., 2016; Munn et al., 2018; Tricco et al., 2016).

Moreover, as previously established, evidence on playground design for inclusion is only emerging. Although some effort had been made in recent years to study the research evidence for public playground design for inclusion in the public realm (Alsarawi, 2020; Brown et al., 2021; Burke, 2013; Casey, 2017; Fernelius & Christensen, 2017; Moore & Lynch, 2015; Prellwitz & Lynch, 2018; van Engelen et al., 2021); no work had yet been done to synthesise evidence for UD or analyse its use in more detail for public playground design. Therefore, the overall aim of this thesis was to establish an evidence base for using UD for public playground design. Moreover, research aims were established for each of the studies that comprise this doctoral research, therefore, different designs were chosen to realise the respective aims of each of the studies.

Specifically, studies I, II, and III, aimed to examine broad areas, identify gaps in the research knowledge base, clarify key concepts, and report on the types of evidence that address and inform practice in the field. Therefore, scoping reviews were deemed appropriate for studies I, II and III as they explored evidence from a higher conceptual level as well as an applied level, in response to specific knowledge gaps. In particular, the first (**Study I, Paper I**) and second scoping review studies (**Study II, Paper II**) reviewed academic literature to review the evidence for using UD in public playground design (Study I, Paper I), and the conceptual understanding of UD in public playground design (Study II, Paper II). Because findings from these studies showed limited evidence, it was thought that by examining grey literature guidelines, other forms of evidence could be located rather than in empirical studies. Therefore, the third scoping review study (**Study III, Paper III**) focused on grey literature guidelines for implementing good design for playgrounds; however, a further lack of evidence was found.

Nevertheless, the use of a scoping review method facilitated the compilation of evidence from diverse areas. To respond to the overall aim of the thesis, and respective aims for each of the studies, the first (Study I, Paper I) and second (Study II, Paper II) scoping review studies compiled evidence from empirical studies, while the third scoping review study (Study III, Paper III) assembled evidence from grey literature guideline documents to account for associated pieces of evidence and thus, provide a more complete review of all available evidence on designing public playgrounds for inclusion. Overall, it could be argued that other methods could have been used to synthesise information, such as a narrative review (Cronin et al., 2008; Green et al., 2006; Levy & Ellis, 2006; Watson & Webster, 2020; Webster & Watson, 2002), a descriptive or mapping review (King & He, 2005; Paré et al., 2015; Petersen et al., 2015), or a critical review (Kirkevold, 1997; Paré et al., 2015). However, as noted, a scoping review method is deemed appropriate where the research topic is complex or has not previously been review comprehensively (Arksey & O'Malley, 2005; Peters et al., 2015; Pham et al., 2014).

Moreover, a scoping review study search is underpinned by a prerequisite to identify all relevant literature suitable for answering the research question(s) (Paré & Kitsiou, 2017; Paré et al., 2015); therefore, scoping review studies are systematic, transparent, and replicable. As such, three scoping review studies were deliberately selected by the PhD candidate and her supervisory team to: (a) respond to present knowledge gaps; (b) comprehensively map an emerging evidence base, and (c) ensure the findings of the scoping review studies were rigorous and credible. These three scoping review studies each make an original contribution to knowledge development concerning public playground design for inclusion and the use of UD, and together laid a clear foundation for the two empirical studies that followed. While there are acknowledged limitations, these limitations could serve to better inform future research.

Critical analysis of the overall contribution of this thesis

Notwithstanding the limitations discussed above, the three scoping review studies and two empirical studies that comprise this thesis each made an original contribution to knowledge development concerning public playground design for inclusion and the use of UD from a higher conceptual level as well as an applied level. This research

enquiry was informed by a human rights approach, underpinned by a commitment to understanding the concept of UD as it relates to public playground design.

The first scoping review study (**Study I, Paper I**) was a state-of-the-art review that examined peer reviewed studies, published over a 20-year period, to identify and synthesise what is known about inclusive public playgrounds. Underpinned by a commitment to understanding the concept of UD, this review comprehensively situated this thesis within international literature. Specifically, this review contributed important information regarding the use of UD in the context of reviewing design recommendations and specific design approaches.

The second scoping review study (**Study II, Paper II**) narrowed its focus to explicitly examine how UD, and related non-discriminatory planning and design concepts, have been conceptualised and discussed in the context of peer reviewed studies exploring public playground design for inclusion. While UD has been the focus of research pertaining to public playgrounds, this scoping review study was the first of its kind to provide a comprehensive analysis of how UD and related design concepts are represented amongst playground researchers internationally.

The third scoping review study (**Study III, Paper III**) broadened the lens beyond peer reviewed academic literature and synthesised what is known from international grey literature guidelines for the design of public playgrounds for inclusion. Specifically, scoping review search methods were developed and applied to conduct a scoping review of grey literature guidelines; this systematic analysis of grey literature guideline documents was the first of its kind to provide a broad understanding of how design approaches, principles, and recommendations for designing public playgrounds for inclusion are conceptualised and discussed in guidance documents in many international contexts.

Collectively the three scoping review studies laid the foundation for the two empirical studies that followed; these empirical studies provide new data on from the perspectives of "professional experts" and "user experts". Specifically, the first empirical study (**Study IV, Paper IV**) provides new data on the ways in which UD is understood and implemented by a national sample of playground professionals in the

Republic of Ireland. It was the first survey of its kind to target a national sample of playground professionals in the Republic of Ireland and thus, provides national data that may aid the identification of national and local priorities to better support the implementation of UD for public playground design for inclusion.

Moreover, the second empirical study (**Study V, Paper V**) provides new data from the perspectives of children and adults regarding their experiences of using public playgrounds, as well as the reasons for non-use. Data from this study revealed that although children and adults value playgrounds as spaces for outdoor play, social participation, and inclusion, playgrounds are not always useable, and do not always meet the needs of families. Participants in this study confirmed that there are variable standards when it comes to playground provision, and some facilities lack essential elements for outdoor play, social participation, and inclusion. Nevertheless, participants offered many creative ideas to improve the usability of playgrounds, and therefore, identified potentially practical ways of implementing UD in playground design for inclusion. The adoption of a framework developed by colleagues in New South Wales (Can I get there? Can I play? Can I Stay?) (NSW Government, 2019) to frame the findings contributes to the identification of ideas, from the perspectives of children and adults, to support public playground design for inclusion. Therefore, for UD to fully realise its potential in underpinning the design of public playground for inclusion, it is essential that public playgrounds are co-designed and co-created with user experts and professional experts (Chapter Seven).

In sum, the three scoping review studies and two empirical studies that comprise this thesis contribute new knowledge concerning public playground design for inclusion. While there are acknowledged limitations, the five studies establish an evidence base for the use of UD for public playground design, from a higher conceptual level as well as an applied level, in many developed countries. Nevertheless, as noted, person and environment factors of the PEO model were broadly considered across the three scoping review studies, however, there remains ambivalence around what UD is trying to achieve. Indeed, the interaction between a person, the environment, and their occupations is largely overlooked and subsequently, the outcome of inclusion and enabling participation in play occupation in public playgrounds is ambiguous.

To respond to these knowledge gaps, as well as to criticisms whereby researchers have identified that the application of UD for playgrounds is particularly problematic when considering the need to design for play (Casey, 2017; Lynch et al., 2019, 2020; Lynch, Moore, et al., 2018; Prellwitz & Lynch, 2018), a novel concept, UDP, was developed. As described previously, UDP has the potential to support all children's meaningful engagement and participation in play occupation, by underpinning the design of inclusive public playgrounds. Moreover, the two empirical studies provide new data on from the perspectives of "professional experts" and "user experts" and therefore, contribute an Irish perspective to the growing international body of knowledge on public playground design for inclusion. Nevertheless, the findings presented in these five studies remain open to interpretation and fresh debate as new research continues to emerge.

Furthermore, knowledge derived from the scoping review studies and empirical studies served to inform the new play and recreation space, described in the Impact Case Study (Chapter Eight). Guided by the emerging evidence base, this impact case study offers an example of knowledge translation in practice that resulted in a sustainable benefit that impacted numerous stakeholders. Certainly, this project was underpinned by a UD approach, and positioned "user experts" alongside "professional experts" to co-design the inclusive play and recreation space.

Lastly, this doctoral research resulted in the publication of four (**Studies I – IV**) out of the five studies that were published in multidisciplinary journals. As noted, this doctoral research was conducted under the profession of occupational therapy, however, it was necessary to publish the findings from the studies in non-traditional places (i.e., non-occupational therapy journals) as playground design for inclusion attracts a multidisciplinary audience in terms of research and practice. As such, this research transcended any one specific discipline and consequently, a decision was made early on to publish the findings of the studies in multidisciplinary journals, and to publish Open Access where possible (i.e., where University College Cork held Irish Research eLibrary [IReL] Open Access agreements with publishers[76]). The aim of publishing in such journals was, three-fold; first, to facilitate effective exchange and

[76] https://libguides.ucc.ie/OAagreements

dialogue between different scientific interests and add to the current knowledge base, second, to reach a larger multidisciplinary audience (within and outside the professional realm) for whom this research has implications, and third, to uphold the PhD candidate's, her co-authors', and her funding body's (Irish Research Council in this instance[77]) commitment to Open Science.

As noted previously, the manuscript for the second empirical study (**Study V, Paper V**) is currently in preparation for publication; the intention is to publish this study in a multidisciplinary journal also.

Implications for policy, practice, and research

This thesis contributes an evidence base for the use of UD from a higher conceptual level as well as an applied level. Specifically, this thesis contributes a detailed analysis of existing published and grey literature and contributes new data from "professional experts" and "user experts". Considering the findings of this doctoral research, implications are presented next as they relate to policy, practice, and research. Many of these implications were highlighted in the five studies that comprise this thesis; therefore, key implications are highlighted here.

Implications for policy

Implications for policy can be subdivided into implications for policy at an international, national, and local level. Overall, despite policy developments, there is a significant lack of play policies in national contexts to operationalise country-specific approaches on providing for play (Lynch, 2023; Lynch, Moore, et al., 2018). Even so, General Comment No. 17 (GC17) (CRC, 2013) identifies key areas that need to be addressed to fulfil the rights of all children, including, the provision of inclusive play facilities, the application of a UD approach, the inclusion of children in designing for play, and the need to work collaboratively to build inclusive societies. Therefore, at an international level, there is a need for further policy development in national contexts that address the identified areas, so that any response to play provision are culturally relevant and not universally applied as no one size fits all (Lynch, 2023). As noted by Valerie Watchorn and colleagues (2021), including a "focus on occupational

[77] https://research.ie/

and social participation, multi- and trans-disciplinary collaboration (both within and outside the professional realm), and multicultural perspectives (beyond Western [i.e., Global North] and disability-based understandings)" is essential (p. 11). Moreover, leadership from already established organisations that are well positioned to progress this agenda, such as Centres of Excellence in UD, is vital.

Additionally, to safeguard the implementation of UD at an international level, there is a need to ensure that successor documents to GC17 (CRC, 2013) place further emphasis on how to translate UD into practice. Impact case studies, such as that presented in Chapter Eight, and practice examples could assist in providing practical guidance in this regard. Moreover, as a nation, Ireland needs to draw inspiration from international counterparts that are committed to incorporating the UNCRC (UN, 1989) into law (Sweden[78] and Scotland[79]) and incorporating play sufficiency duties in government antipoverty agendas (Scotland[80] and Wales[81]), for example, to ensure that the play rights of all children are upheld and fulfilled. A fundamental first step in this regard could be the updating of the National Play Policy to include recommendations set forth in GC17 to ensure respect for and strengthen the application of the rights under article 31 (CRC, 2013). Finally, at a national level, there is a fundamental need to ensure that local policies, developed by municipalities, align with international conventions and national policies. Specifically, the inclusion of UD in all such documents must be viewed as mandatory.

Implications for practice

Like implications for policy, implications for practice can also be divided into implications for practice at an international, national, and local level. As mentioned, GC17 (CRC, 2013) specifically highlighted the need to provide inclusive play facilities, apply the UD approach, include children in designing for play, and collaborative working to build inclusive societies. Moreover, GC17 restates that all professionals working with or for children, or whose work impacts on children, must

[78] https://www.government.se/articles/2015/02/convention-on-the-rights-of-the-child-about-to-become-swedish-law/
[79] https://www.gov.scot/publications/united-nations-convention-rights-child-incorporation-scotland-bill-leaflet/
[80] https://www.gov.scot/publications/consultation-open-space-strategies-play-sufficiency-assessments-regulations/pages/6/
[81] https://playwales.org.uk/eng/sufficiency

receive systematic and ongoing training on the human rights of all children. Therefore, at an international level, there is a need for further practice that addresses the identified areas, to ensure that the rights of all children are fulfilled.

Moreover, at an international level, there is a need for further multi- and trans-disciplinary collaboration to consolidate the importance and future application of a new concept, UD for Play (UDP), in the design of public playgrounds that promote outdoor play, social participation, and inclusion. At a national level, there is a fundamental need to raise awareness of the need to incorporate UD for public playground design for inclusion to ensure that existing legislation, policies, and standards are implemented consistently. This would warrant a multidisciplinary approach to educational provision at all levels. However, the implementation of education is not enough; there would also be a need to mandate the introduction of UD into professional curricula as well as comprehensive assessments and tools to measure the impact of education.

Moreover, in the UK, *The Children's Play Policy Forum*, and the *Play Safety Forum* (2022), recently issued a joint statement that calls upon municipalities to create accessible and inclusive child play spaces; the same could be done for the Irish context. Finally, at a local level, as described across all five studies, there is a need to include "user experts" and incorporate participatory or co-design approaches that position communities at the heart of the design process when planning, designing, and/or renovating new or existing public playgrounds. The impact case study, described in Chapter Eight, can serve as a blueprint in this regard.

Implications for research

While specific research directions have already been highlighted, implications for research at an international, national, and local level are highlighted here. Indeed, since the inception of this doctoral research in September 2019, excluding the studies emerging from this doctoral research, numerous articles have been published on the topic of public playground design for inclusion (e.g., Alsarawi, 2020; Bhuyan, 2022; Black & Ollerton, 2022; Brown et al., 2021; Dalprà, 2020; Hill & Chawla, 2019; Lynch et al., 2019, 2020; Parker & Al-Maiyah, 2022; Stanton-Chapman & Schmidt, 2019; Stanton-Chapman et al., 2020; Sterman et al., 2019; van Engelen et al., 2021;

Van Melik & Althuizen, 2022; Wenger et al., 2022; Wenger et al., 2021), suggesting a growing demand for and need for research on the topic. Moreover, as previously identified, GC17 (CRC, 2013) identifies key areas that need to be addressed, including, the provision of inclusive play facilities, the application of a UD approach, the inclusion of children in designing for play, and the need to work collaboratively to build inclusive societies. Therefore, to fulfil the rights of all children, at an international level, there is a need for further research that addresses the identified areas.

Moreover, the consistent use of "UD" internationally is recommended as a strategy to manage and promote the synthesis of evidence on public playground design for inclusion given that UD is the design approach that has been specifically endorsed by the international community (CRC, 2013; UN, 2006). Also, multi-, and trans-disciplinary collaborative research is required to consolidate the importance and future application of UD for Play (UDP). At a national level, there is a need to develop culturally relevant guidance documents on how to translate UD into practice for public playground design for inclusion. Moreover, as mentioned, at a national and local level, there is a need to respond to the limitations of the empirical studies in this thesis. Furthermore, there is also a need to incorporate participatory or co-design approaches that position communities at the heart of the design process when planning, designing, and/or renovating new or existing public playgrounds. Finally, there is a need to further develop assessment methods and tools to measure outcomes from numerous and diverse perspectives.

Implications for policy, practice, and research: A focus on occupational therapy

Given that this PhD research was conducted under the discipline of occupational science and profession of occupational therapy, it is important then, to specifically translate these implications into practical guidance for occupational therapists.

Policy

At the level of policy, Lencucha and Shikako-Thomas (2019) asserted that occupational therapists have "… missed opportunities to align or embed occupational therapy principles and values into policy making" (p. 192). Yet, they identified that "occupational therapy research and practice related to policy has huge potential for

growth", particularly in the context of "… participation, equity, and justice" (Lencucha & Shikako-Thomas, 2019, p. 192). Moreover, professional therapy organisations have called upon scholars and practitioners to act on the level of policy (Williams et al., 2017), and this has been further echoed in playground research (e.g., Moore & Lynch, 2015). Therefore, because UD and inclusive playground design impact upon participation, equity, and justice, it is of fundamental importance that occupational therapists "… advocate in and act on the policy process" (Lencucha & Shikako-Thomas, 2019, p. 192), particularly as they relate to human/child rights, UD, and the design of inclusive built environments for play.

Even so, Cairney and Kwiatkowski (2017) identified that to recognise opportunities to act, occupational therapists must first understand the political, social, and economic context of policy so that they make effective contributions to the policy process. Nevertheless, in the international context, the minimum standards for the education of occupational therapists (WFOT, 2016) sets out the need for graduates to have specific knowledge on the person-environment-occupation (PEO) relationship and its relationship to health, wellbeing, and human rights, as well as understand contexts of practice locally, nationally, and internationally. As such, graduating therapists are expected to possess the knowledge, skills, and attitudes required (WFOT, 2016) to make effective contributions to the policy processes, and, in the context of this thesis, contributions with reference to children's play rights, UD, and the design of inclusive built environments for play. Moreover, to make effective contributions to the policy process, occupational therapists can draw upon recommendations, tools, and guidance from national occupational therapy organisations to structure messages, identify opportunities, and position themselves in decision-making processes (Lencucha & Shikako-Thomas, 2019) locally, nationally, and internationally. Also, it is suggested that occupational therapy governing bodies that set out the competencies for occupational therapists at an international level (e.g., WFOT) offer additional direction through more formalised recommendations, tools, and guidance for occupational therapy practice in policy making.

Furthermore, at an individual therapist level, Larkin and colleagues (2015) asserted that occupational therapists "must become skilled in working with complexity within political and policy frameworks to transfer our existing specialist knowledge and skills

to advocacy around universal design in the built environment for the community as a whole" (p. 8168). Consequently, occupational therapists will need to adopt not only conventional ways of working but also non-conventional ways of working to address play needs at the individual level as well as community and policy levels through engagement in social and political action (Lynch, 2023; Moore & Lynch, 2015). For example, within the Irish context, it is suggested that occupational therapists work with multi- and trans-disciplinary government departments to incorporate the UNCRC (UN, 1989) into law, and include play sufficiency duties in government antipoverty agendas. A fundamental first step in this regard could be the updating of the National Play Policy (NCO, 2004). Moreover, it is recommended that occupational therapists be placed centrally in the National Disability Authority to work closely with the Centre for Excellence in Universal Design to support policy developments and the establishment of formal guidelines for inclusive public playground provision. At a local level then, it is proposed that occupational therapists work with local councils to develop policies for inclusive play provision and attend to participation, equity, and justice issues.

Practice

At the level of practice, Hitch and colleagues (2012) asserted that "if as a profession [i.e., the occupational therapy profession] we are committed to equity and diversity and the health and wellbeing of communities and the individuals within them, we need to ensure that we have the understanding, skills and expertise to ensure that built environments are not a barrier to people's ability to participate in their everyday occupations and roles" (p. 382). They further highlighted that this will "necessitate a shift from the current individual, treatment focus of the profession to one which takes a population, advocacy perspective" (Hitch et al., 2012, p. 382).

In the context of playground environments, Moore and Lynch (2015) asserted that "occupational therapists are required to move beyond the clinical setting and become more socially responsive and client centred in natural community playground environments. This approach has the capacity not only to support occupationally just practice, but also to address a population health agenda for childhood …" (p. 341). Specifically, they proposed a three-tiered (universal, targeted, and intensive) approach and identified "… examples of practice that includes advocacy work with

communities, and legislative, policy, and standards authorities as a means of developing accessible, usable, and inclusive playground environments for all children" (Moore & Lynch, 2015, p. 341). In this way, occupational therapists could not only provide reactive services, but also socially responsive services that address population health agendas via an upstream approach of attending to participation, equity, and justice issues.

One such example of how this could be achieved was articulated in the impact case study presented in Chapter Eight. Still, such a proposal necessitates a need for contextual interventions (Lynch, 2023; Moore & Lynch, 2015), which in turn, calls for a wider endorsement of context-focussed therapy by local and national employers, as well as international organisations. To achieve these goals, it is suggested that national and local employers formally establish multi- and trans-disciplinary roles in non-traditional areas (including a role for occupational therapists) and the appropriate infrastructure to support such practice (i.e., establish systems and policies that promote and sustain context-focussed therapy practice). Moreover, international organisations will be required to establish more formal competencies to ensure that occupational therapists (at all grade levels) possess the professional competency required for context-focussed therapy. Finally, it is recommended that international occupational therapist organisations articulate the scope of OT to include context-focussed therapy and establish guidance on how to operationalise context-focussed therapy in practice.

Research

At the level of research, occupational therapists and indeed occupational scientists need to engage in international multi- and trans-disciplinary collaboration to consolidate the importance and future application of UD for Play (UDP), given their unique knowledge on play occupation, and the transactional relationship between people, environments, and occupations. Moreover, occupational therapists and occupational scientists, informed by the findings from the studies that comprise this thesis, promote the universal establishment of UD as a design approach for public playground design and provision so that all public patrons can access, use, and be included in these spaces without injustice. Furthermore, occupational therapists and occupational scientists need to engage in research to provide further evidence on

contextual interventions, as few efforts to date, have examined the different approaches to play intervention (Lynch, 2023).

At a national level, there is a need to establish evidence-based guidance on how to operationalise context-focussed therapy in practice. It is suggested that a multi- and trans-disciplinary expert working group collaborate on the development of international evidence-based guidance, which necessitates the involvement of end-user groups also to ensure that any such guidelines are fit for purpose. Locally then, the impact case study outlined in Chapter Eight can be viewed as an example of how occupational therapists and occupational scientists engage in research to provide further evidence on contextual interventions. It is recommended that practice examples such as this, that are in receipt of national occupational Therapy awards (Ann Beckett Award, outlined in Chapter Eight), would support national and local employers to formally establish multi- and trans-disciplinary roles in non-traditional areas, as outlined previously.

Further considerations for future research are presented next.

Points of departure for future research

As this doctoral research draws to a close, it is appropriate to consider possibilities for future research. The findings of this doctoral research highlight the use of UD for public playground design for inclusion from a higher conceptual level as well as an applied level. However, a few potential future research directions are identified below to build upon findings and address the limitations of this doctoral research. While directions for future research are considered in the corresponding chapters for each of the five studies that comprise this thesis, key directions for future research are highlighted here.

As noted, the PhD candidate and her co-authors suggested a novel concept, UDP, to better support the overall design of inclusive public playgrounds. However, as a relatively new concept, they determined that principles and guidelines were required to support its evidence base and subsequent implementation in built environments for play (i.e., public playgrounds in this instance). They further suggested in the second (**Study II, Paper II**) and third (**Study III, Paper III**) scoping review studies that

multi- and trans-disciplinary collaboration (within and outside the professional realm), as well as multicultural perspectives (from the global south and global north) would be required to enhance the usefulness of the concept. Therefore, considering these findings, more research that responds to the identified needs is required to consolidate the importance of and future application of UDP alongside researching design solutions for supporting all children's meaningful engagement and participation in play occupation.

Moreover, the empirical studies with "professional experts" (**Study IV, Paper IV**) and "user experts" (**Study V, Paper V**) had relatively small sample sizes. Consequently, future research efforts could include longitudinal research, as well as qualitative and quantitative methods, to address a greater diversity of topics about public playground design for inclusion. Specifically, further international research with "professional experts" and "user-experts" is required to strengthen knowledge on socio-spatial inclusion to enable the UD concept to reach its full potential as a medium for social justice in public playground design for inclusion. Indeed for "user experts", as described across all five studies, there is a need to include diverse public playground users and non-users to address gaps in knowledge regarding children's voice from migrants, lower socioeconomic communities, and intergenerational users with disabilities, to inform public playground design for all public playground patrons.

Concluding statement

Informed by an occupational perspective of play as an occupation, and the requirement to provide universally designed built environments for play from a human/child rights perspective, this doctoral research has attempted to establish an evidence base for using UD for public playground design by exploring evidence from a higher conceptual level as well as an applied level. The scope of this doctoral research encompassed a multi-layered approach to understanding this complex concept of UD and included five studies that employed multiple methods to review published and grey literature as well as explore the perspectives of "professional experts" and "user experts". To that end, this doctoral research contributes an evidence base for using UD for public playground design; specifically, this thesis contributes a detailed analysis of existing published and grey literature and contributes new data from "professional experts" and "user experts". However, it challenges the current UD concept and argues

for further conceptual refinement to consolidate the importance and future application of UD for Play (UDP) in the design of public playgrounds that promote outdoor play (with high play value), social participation, and inclusion. Moving forward the challenge is to promote the universal establishment of UD as a design approach for public playground design and provision so that all public patrons can access, use, and be included in these spaces without injustice.

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List of Appendices

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Appendix A: PhD outputs and related activities

The PhD candidate was involved in numerous activities over the course of her PhD studies. Therefore, the PhD outputs and related activities will be listed first. Then, other outputs and related activities that the PhD contributed to over the course of her PhD studies will be listed.

PhD Outputs

Journal articles:

- **Moore, A**., Lynch, H., & Boyle, B. (2022). Can universal design support outdoor play, social participation, and inclusion in public playgrounds? A scoping review. *Disability and Rehabilitation, 44*(13), 3304-3325. https://doi.org/10.1080/09638288.2020.1858353 **[Impact Factor 2020: 3.033]**
- **Moore, A**., Boyle, B., & Lynch, H. (2022). Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of universal design. *Disability and Rehabilitation: Assistive Technology*. Advance online publication. https://doi.org/10.1080/17483107.2021.2022788 **[Impact Factor 2020: 2.500]**
- **Moore, A**., Boyle, B., & Lynch, H. (2022). Designing public playgrounds for inclusion: A scoping review of grey literature guidelines for universal design. *Children's Geographies*. Advance online publication. https://doi.org/10.1080/14733285.2022.2073197 **[Impact Factor 2020: 2.291]**
- **Moore, A**., Lynch, H., & Boyle, B. (2022). A national study of playground professionals universal design implementation practices. *Landscape Research, 47*(5), 611-627. https://doi.org/10.1080/01426397.2022.2058478 **[Impact Factor 2020: 2.055]**

Invited publications (book chapter and journal article):

- The PhD candidate was invited, alongside Dr Helen Lynch, to co-author a chapter on *Intervention for Play* in the ninth edition of the prestigious

Occupational Therapy for Children textbook. A draft version of this chapter was submitted in October 2022.

- The PhD candidate was invited, alongside key occupational therapy and occupational science contributors on the topic of play, to review contributions to the American Journal of Occupational Therapy regarding the state of the science of play. Contributors will include Diane Parham, Anita Bundy, Sarah Fabrizi, Karen Stagnitti, Heather Miller Kuhaneck, Helen Lynch, and Alice Moore. We plan to write this paper in Autumn 2022.
- The PhD candidate was invited, alongside Dr Helen Lynch and Dr Bryan Boyle, to co-author a chapter on *Social Policy Influences on Play Provision in Community Contexts: A Rights-Based Perspective in Designing for Sociospatial Inclusion* in the third edition of the prestigious *Parham: Play in Occupational Therapy for Children* textbook. We plan to submit a draft version of this chapter in Summer 2023.

Conference presentations:

- **Moore, A.**, & Lynch, H. (2022). *Crann inclusive playground project: Design by inclusion, inclusion by design*. Association of Occupational Therapists 2022 Conference: Athlone, Ireland, October 07 – 08.
- **Moore, A**., Boyle, B., & Lynch, H. (2022, October*). What's in a word: Are design concepts connected or disconnected in supporting participation in playgrounds?* [Paper presentation]. 10th Child in the City World Conference: Dublin, Ireland.
- **Moore, A**., Lynch, H., Boyle, B. (2022, August 18): *Tackling play inequality through Universal Design: A survey of Irish playground professionals* [Paper presentation]. World Occupational Science Conference: Vancouver, Canada.
- **Moore, A**., Lynch, H., & Boyle, B. (2022, August 28). *Tackling play inequalities in community playgrounds: A scoping review of evidence to explore the role of universal design in supporting outdoor play, social participation, and inclusion* [Paper presentation]. 18th World Federation for Occupational Therapists Congress: Paris, France.

- **Moore, A.**, & Lynch, H. (2022, March 31). *Applying universal design: A journey into space* [Paper presentation]. Through the looking glass: Play and inclusion conference: Cork, Ireland.
- **Moore, A.**, Lynch, H., & Boyle, B. (2021, July 07). *Inclusive public playground design: A scoping review of grey literature guidelines* [Paper presentation]. Play 2021 Conference: Virtual Conference.

Invited presentations:

- **Moore, A.**, & Lynch, H. (2022, March 31). *Applying universal design: A journey into space* [Paper presentation]. Through the looking glass: Play and inclusion conference: Cork, Ireland.
- **Moore, A**. (2021, October 06). *Designing playgrounds for inclusion* [Paper presentation]. International Alliance of Academics of Childhood Disability [Webinar].
- Lynch, H., & **Moore, A**. (2020, November 26). *Imagine Dundrum: Child-friendly cities and play* [Paper presentation]. Imagine Dundrum [Webinar].

PhD related activities

Completed professional training and development modules:

- PG6025 Community-Based Participatory Research (UCC; Awarded 5 credits)
- PG6015 An Introduction to Research Integrity, Ethics and Open Science. (UCC; Awarded 5 credits)
- PG6009 Graduate Information and Literacy Skills. (UCC; Awarded 5 credits)

Professional training and development courses taken:

- Savage, E. "Pivoting for career success beyond the PhD". (Graduate Studies Workshop, UCC, May 18, 2022).
- Epigeum Online Research Integrity Training for Researchers, 2nd Edition (Core and Specialist Modules; December 8 – 9, 2021)
- NVivo two-day intensive training (QDA Training; 24 & 25 June 2021)
- Cork Discovers 2020 video workshop for disseminating research (Vidacademy, October 23, 2020)
- Hugh Kearns Workshop: Turbocharge your writing (UCC, January 21, 2020)

- Hugh Kearns Workshop: Presenting your research with confidence (UCC, January 20, 2020)
- Hugh Kearns Workshop: How to plan your PhD (UCC, January 20, 2020)
- Hugh Kearns Workshop: The seven secrets of highly successful research students (UCC, January 20, 2020)
- Endnote for Beginners (UCC, November 22, 2019)
- ISS21 Research Master Class – Child Methodologies (UCC, October 24 – 25, 2019)

Conferences (in addition to the above) and study days attended:

- CP4Europe child and youth participation for Europe. (University College Cork, May 23 – 25, 2022): Attendee.
- Through the looking glass – Play and inclusion. (March 31, 2022): Administrator, contributor, and attendee.
- The Lundy model and child friendly research practice. (P4PLAY Training School, March 30, 2022): Attendee.
- Embedding occupational science in research. (P4PLAY Training School, March 30, 2022): Attendee.
- Children's advisory groups from experience. (P4PLAY Training School, March 29, 2022): Attendee.
- Participation and decision-making. (P4PLAY Training School, March 29, 2022): Attendee.
- University College Cork Planning Conference 2022. (Virtual Conference, March 23, 2022): Attendee.
- Occupational Science Europe (OSE) Annual Conference (Virtual Conference, November 17, 2021): Attendee.
- Play 2021 Conference on Children, Play and Space (Virtual Conference, July 7 – 8, 2021): Contributor and attendee.
- Landscape Institute CPD Inclusive Environments (Virtual Conference, June 15-17, 2021): Attendee.
- Association of Occupational Therapists (AOTI) Annual Conference (Virtual Conference, October 09, 2020): Attendee.

- Paediatric Advisory Group (AOTI) study day 2020 “A new normal for Paediatric OT – how does it look for you?” (November 20, 2020): Attendee.
- SSO: USA Annual Occupational Science Conference (Scottsdale, Arizona, USA, October 3 – 5, 2019): Attendee.
- Unleashing the power of play in school playgrounds, City Hall, Cork (25 September, 2019): Attendee.

Webinars attended:

- McKendrick, J. “Marginalisation: fences of childhood and stigma”. (P4PLAY Play Module, July 19, 2022). Attendee.
- Dublin City University “International Symposium on Play in Early Childhood Education”. (May 20, 2022): Attendee.
- Bundy, A. “Play”. (P4PLAY Play Module, April 26, 2022). Attendee.
- Københavns Universitet, SCIENCE. “Risky play – Children’s own versus adult’s perception of risks when playing in natural environments”. (April 07, 2022): Attendee.
- National Standards Authority of Ireland. “Emerging opportunities in design standards for our built environment: well-being, inclusion and Universal Design”. (March 25, 2022): Attendee.
- Harbottle, H., & Coughlan, J. “Playspaces, standards, and assessment”. (P4PLAY Module, February 22, 2022): Attendee.
- Harbottle, H., & Coughlan, J. “Playspaces”. (P4PLAY Play Module, July 27, 2021): Attendee.
- Harbottle, H., & Coughlan, J. “Inclusive design and play: Child-friendly planning is good for everyone”. (P4PLAY Play Module, June 29, 2021): Attendee.
- Let’s Grow Together! “Learning from others to develop Child Friendly City Cork”. (January 25, 2022): Attendee.
- “All About Occupation” Seminar Series (2021): Attendee
- Hugh Kearns “Staying well and being productive (while social distancing)” (April 16, 2021): Attendee.

- PlayCore Scholar Series "Creating Conditions of Possibility: Diverse, equitable, and inclusive recreation space for individuals with disabilities" (March 03, 2021): Attendee.
- Professionals working for the participation of children: "Listen – Act – Change" (Council of Europe, January 21, 2021): Attendee.
- Mary McAleese & Sally Holland 'From child to world citizen: but what kind of world?' (October 2020): Attendee.
- Occupational Therapy Europe: "Promoting meaningful dialogue about diversity, equity, and inclusion in occupation-based learning, teaching, practice, and research" (October 2020): Attendee.
- Jupiter Play Ltd. "The Truth About Inclusion; The Good, The Bad & The Tokenistic" (November 3, 2020): Attendee.
- International Play Association Webinar Series "Play and Public Place: Making Cities Child Friendly in the Post Pandemic World (6 weeks, November – December 2020): Attendee.

Report and book launches attended:

- Children's Research Network. "Child and Youth Participation in Policy, Practice, and Research" launch. (March 11, 2022). Attendee.
- Children's Rights Alliance. "Report Card 2022" launch. (February 2021, 2022): Attendee.
- Kilkelly, U., & Lundy, L. "Incorporating the UNCRC into National Law" launch (November 17, 2021): Attendee.
- Department of Children, Equality, Disability, Integration and Youth "National Implementation Framework for Children and Young People's Participation in Decision Making" launch (April 14, 2021): Attendee.
- Ombudsman for Children "Mind the Gap Report" launch (March 29, 2021): Attendee.
- Children's Rights Alliance "Report Card 2021" launch (February 23, 2021): Attendee.
- Ring et al., (2021) "Leading Inclusion from the Inside Out; A Handbook for Parents and Early Childhood Teachers in Early Learning and Care,

Primary and Special School Settings" launch (February 17, 2021): Attendee.

- Cork Healthy Cities "Cork Healthy Cities Action Plan 2020 – 2030" launch (February 01, 2021): Attendee.

Journal reviewing:

- Invited peer reviewer for the *Journal of Occupational Science*. See: https://publons.com/researcher/4577608/alice-moore/
- Invited peer reviewed for *Children's Geographies Journal*. See: https://publons.com/researcher/4577608/alice-moore/

Submissions to public consultations:

- The PhD candidate collaborated with Dr. Helen Lynch and two Early-Stage Researchers on the P4PLAY[82] programme in February 2022 to make a formal submission for the public consultation on the next Government Policy Framework for children and young people in Ireland. This submission was focused specifically on the play rights (Article 31) of the child.
- The PhD candidate collaborated with a wide team of researchers in September/ October 2021 to analyse artwork data from 24 primary and 4 post-primary schools and make a formal submission to the Cork City Draft Development Plan 2022 – 2028. This submission[83] was focused specifically on what would make Cork a better place to live, from the perspectives of children and young people.

Other Outputs

National Publications:

- Lynch, H., Ring, E., Boyle, B., **Moore, A.**, O'Toole, C., et al. (2020). *Evaluation of In-School and Early Years Therapy Support Demonstration Project*. National Council for Special Education.

[82] https://www.p4play.eu/
[83] https://consult.corkcity.ie/en/submission/crk-c155-dev21-203

Journal articles:

- Lynch, H., Moore, A., O'Connor, D., & Boyle, B. (2023). Evidence for Implementing Tiered Approaches in School-Based Occupational Therapy in Elementary Schools: A Scoping Review. *The American Journal of Occupational Therapy, 77*(1), 7701205110.
- Lynch, H., **Moore, A**., Edwards, C., & Horgan, L. (2020). Advancing play participation for all: The challenge of addressing play diversity and inclusion in community parks and playgrounds. *British Journal of Occupational Therapy*, *83*(2), 107-117. https://doi.org/10.1177/0308022619881936

Scoping review protocol:

- Lynch, H., **Moore, A.**, O'Connor, D., & Boyle, B. (2021, November 23). Scoping review protocol for tiered models: School Based Occupational Therapy in Elementary Schools. https://doi.org/10.17605/OSF.IO/VUXHF

Journal articles under development:

- O' Connor, D., **Moore, A**., & Lynch, H. Children's participation rights: A survey of paediatric occupational therapists in Ireland.

Conference presentations

- O'Connor, D., **Moore, A**., & Lynch, H. (2022, October). *Children's participation rights: A survey of paediatric occupational therapists in Ireland*. [Paper presentation]. Association of Occupational Therapists 2022 Conference: Athlone, Ireland.

Media contributions:

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Workshop contributions:

- Lynch, H., & **Moore, A.** (2020). Play researchers – Cork Discovers 2020 [Video]. YouTube. https://youtu.be/GQAD5JfeJ9Y
- The PhD candidate contributed to Cork Discovers, a European research initiative set up to celebrate researchers. In conjunction with members of the Department of Occupational Science and Occupational Therapy, UCC, the PhD candidate hosted a stand on outdoor play and inclusion. (Nano Nagle Place, Cork, September 27, 2019).
- The PhD candidate contributed to a workshop organised by the Children's Research Network Ireland. The focus of the workshop was developing a consensus for the development of guidelines for inclusive outdoor play provision in Ireland. The PhD candidate delivered an invited lecture in conjunction with Dr Helen Lynch based on our continued work in the area. (Trinity College Dublin, November 29, 2019).

Community engagement:

- The PhD candidate engaged with numerous community groups to develop their outdoor spaces for play, in Cork and nationally. See highlights below:
    - The PhD candidate was approached by a local service provider for children with disabilities to develop their outdoor space for play (2020 – present).
    - Working in conjunction with the Education Department in UCC, The PhD candidate contributed as an advisor for inclusive play solutions for a new outdoor play space for an early learning and care (ELC) centre in UCC (2018 – 2019).
- The PhD candidate is an active member of a Cork Playful City group. A Playful City is Ireland's first not-for-profit focused on creating more playful, engaging, and inclusive cities with and for communities.
- The PhD candidate was invited as an expert to contribute to the development of play policies with two County Councils in Ireland (Dun Laoghaire/Rathdown, and Fingal), in 2020.
- The PhD candidate was approached by the Housing Advisory Group as part of the Association of Occupational Therapists of Ireland to co-author a chapter

on designing learning environments. I aim to write this chapter in collaboration with a colleague in the coming months.

- The PhD candidate liaised (July 2021) with a senior occupational therapist from the Brothers of Charity to offer advice and support for the development of an "activity space" within a residential setting.
- The PhD candidate liaised (February 2022) with a local museum to support their application for funding to support access and inclusion (through the medium of play) for children to these heritage sites, with particular focus on those children who are frequently disadvantaged due to age, ability, or disability. This funding application was successful, and the PhD candidate continues to support this initiative.
- The PhD candidate liaised (March 2022) with an inclusive outdoors coordinator for Cara Sport Inclusion Ireland to offer advice and support for their redevelopment of the workshop based on Access Great Outdoors document which was originally designed by IWA sport and Sport Ireland.

Curriculum development:

- The PhD candidate contributed to the development of a new module for the Education department in UCC. In collaboration Dr Helen Lynch, a proposal for a module that focuses on play, play diversity and inclusion for children at risk of play deprivation was developed. The PhD candidate will deliver this module in Autumn 2022.
- The PhD candidate liaised (March 2022) with P4PLAY ESR students and supervisors to determine key priorities for module content for this new play module.

Programme approval in University College Cork:

- The PhD candidate contributed as a student representative on a programme approval board for a new PhD programme in Occupational Science in University College Cork (University College Cork, March 23, 2021)

***Awards*:**

- **National AOTI Ann Beckett Award 2021/2022**: In collaboration with her primary supervisor (Dr Helen Lynch), The PhD candidate worked in partnership with a local service to develop their outdoor space for play and recreation (2020 – present). This project (Design by inclusion, inclusion by design) won the 2021/2022 Ann Beckett Award[84]. In their letter of congratulations, the Ann Beckett Award Committee acknowledged that they were "*particularly impressed by the inclusive practices used throughout the design and implementation of this project*". They further acknowledged that "*the collaboration between occupational therapists, services and communities has seen the vision of an inclusive play space come to fruition and the benefits are wide-ranging*".
- **HUB na nÓg example of good practice:** I collaborated with a local service to develop their outdoor space for play and recreation (2020 – ongoing). This project ("Design by inclusion, inclusion by design") was shortlisted as an example of good practice for including children and young people in research. Awaiting outcome.

[84] https://www.aoti.ie/about-us/Ann-Beckett-Award

Appendix B: Pertinent legislation and public policies for Universal Design

Ireland is a member state of the United Nations, the European Union, and the Council of Europe, therefore, Irish legislation and policy is governed by a multi-tiered system. There is significant legislation and public policy from International, European, and National contexts relevant to UD in Ireland; however, for the purpose of this thesis, the main legislation and public policy will be presented.

International Context

United Nations Convention on the Rights of the Child

The United Nations Convention on the Rights of the Child (UNCRC) was adopted by the General Assembly of the United Nations on 20 November 1989 (United Nations [UN], 1989), after a ten-year drafting process, and it was open for signature on 26 January 1990 (Janot & Rico, 2020). The UNCRC was the first legally binding international agreement setting out the civil, political, economic, social, and cultural rights of every child (Moloney et al., 2021). The introduction of the UNCRC demonstrated a shift in society's attitude, from the historical perceptions of children as passive dependents to viewing children as deserving of individual status and rights (Moloney et al., 2021). To date, 196 countries have backed this multilateral commitment to protect the fundamental guarantees of childhood, making it the most ratified international human rights treaty in history (Janot & Rico, 2020; Rico & Janot, 2019).

The Irish Government signed the UNCRC on 30 September 1990 and ratified it on 28 September 1992. Unlike a signature, ratification means that States Parties (Governments) commit to undertaking all appropriate legislative, administrative and other measures for the full realisation of provisions of the UNCRC, and thus, can be held accountable for violations of the rights it contains. Although all 54 articles contained within the UNCRC must be considered holistically, as all rights serve to reinforce each other (UN, 1989), there are four articles that are especially useful to consider when providing for children's play (Table 1):

Table 1: UNCRC Articles

Article 31: Rest, play, culture, arts 1. States Parties recognise the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts. 2. States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.
Article 23: Children with disabilities States Parties recognise that a mentally or physically disabled child should enjoy a full and decent life, in conditions which ensure dignity, promote self-reliance, and facilitate the child's active participation in the community.
Article 12: Respect for children's views States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.
Article 2: No discrimination States Parties shall respect and ensure the rights set forth in the present Convention to each child within their jurisdiction without discrimination of any kind.

To oversee the implementation of the UNCRC for States Parties, the United Nations Committee on the Rights of the Child (CRC), a body made up of independent experts, was established in 1991 (Rico & Janot, 2019, 2021). All States Parties must submit regular reports to the CRC on how the rights are being implemented, initially within two years or ratifying the UNCRC, and thereafter every five years. The CRC examines each report and expresses its concerns and recommendations before forwarding these to the State Party concerned in the form of Concluding Observations (Rico & Janot, 2021).

Concerns that the obligations to uphold the rights contained within Article 31 were not being addressed prompted advocacy by the International Play Association (IPA) (IPA, 2010). With the intention of gathering information from all over the world, the IPA and its allies organised a World Consultation on Children's Right to Play, and consultations were held between January and July 2010 in Bangkok, Beirut, Johannesburg, Mexico City, Bombay, Nairobi, Sofia, and Tokyo (IPA, 2010). More than 400 children and 350 experts in child play participated in the consultation, and a total of 115 infractions were identified to prove noncompliance with Article 31 (IPA, 2010) which, alongside reviews conducted by the CRC, prompted the development of *General Comment 17 on the Right of the Child to Rest, Leisure, Play, Recreational Activities, Cultural Life, and the Arts (Article 31)* by the CRC (CRC, 2013).

On 01 February 2013 the CRC adopted GC17, an authoritative statement on Article 31 (CRC, 2013). In its introduction the CRC expresses its concern with "the poor recognition given by States to the rights contained in Article 31" (CRC, 2013, p.3). It adds that "poor recognition of their significance in the lives of children results in lack of investment in appropriate provisions, weak or non-existent protective legislation and the invisibility of children in national and local-level planning. In general, where investment is made, it is in the provision of structured and organized activities, but equally important is the need to create time and space for children to engage in spontaneous play, recreation, and creativity, and to promote societal attitudes that support and encourage such activity" (CRC, 2013, p. 3). Moreover, although Article 31 applies to all children, the CRC chose to highlight particular "categories" of children at risk of play deprivation; these include: "girls, poor children, children with disabilities, indigenous children, children belonging to minorities, among others" (CRC, 2013, p. 3).

Therefore, to address these issues, the CRC identified numerous recommendations. Specifically, the CRC identified key areas that need to be addressed to fulfil the rights of all children, including, the provision of inclusive play facilities, the inclusion of children in designing for play, and the need to work collaboratively to build inclusive societies (CRC, 2013). Moreover, the CRC identified factors for an optimum environment (Table 2).

Table 2: Factors for an optimum environment, as stated by the Committee on the Rights of the Child (CRC) in General Comment No. 17 (CRC, 2013, pp. 10-11)

Factors for an optimum environment

Children have a spontaneous urge to play and participate in recreational activities and will seek out opportunities to do so in the most unfavourable environments. However, certain conditions need to be assured, in accordance with children's evolving capacities, if they are to realize their rights under article 31 to the optimum extent. As such, children should have:

- Freedom from stress;
- Freedom from social exclusion, prejudice or discrimination;
- An environment secure from social harm or violence;
- An environment sufficiently free from waste, pollution, traffic and other
- physical hazards to allow them to circulate freely and safely within their local neighbourhood;
- Availability of rest appropriate to their age and development;
- Availability of leisure time, free from other demands;
- Accessible space and time for play, free from adult control and management;
- Space and opportunities to play outdoors unaccompanied in a diverse and challenging physical environment, with easy access to supportive adults, when necessary;
- Opportunities to experience, interact with and play in natural environments and the animal world;
- Opportunities to invest in their own space and time so as to create and transform their world, using their imagination and languages;
- Opportunities to explore and understand the cultural and artistic heritage of their community, participate in, create and shape it;
- Opportunities to participate with other children in games, sports and other recreational activities, supported, where necessary, by trained facilitators or coaches;
- Recognition by parents, teachers and society as a whole of the value and legitimacy of the rights provided for in article 31.

Finally, the CRC articulated that necessity of investment in UD for play provision:

> investment in UD is necessary with regard to play, recreational, cultural, arts and sports facilities, buildings, equipment and services, consistent with the obligations to promote inclusion and protect children with disabilities from discrimination. States should engage with non-State actors to ensure the implementation of UD in the planning and production of all materials and venues, for example, accessible entrances to be used by wheelchair users and inclusive design for play environments, including those in schools (CRC, 2013, p. 21).

Thus, UD is considered essential to facilitate play participation and inclusion in public playgrounds.

United Nations Convention on the Rights of Persons with Disabilities

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) and its Optional Protocol was adopted by the General Assembly of the United Nations on 13 December 2006; it opened to signatories on 30 March 2007 and came into force on 03 May 2008 (UN, 2006). The UNCRPD was the first human rights treaty to be developed by disabled people, for disabled people and thus embodies and enshrines key tenets of contemporary disability scholarship and activism – from "nothing about us without us" to a social understanding of disability (Series, 2019).

The UNCRPD specifically applies established human rights principles from the UN Declaration on Human Rights to people with disabilities, and thus, does not create new rights (Magee et al., 2018). It includes civil and political rights to equal treatment and freedom from discrimination, as well as social and economic rights in areas like education, health care, employment, and transport. States Parties that ratify the UNCRPD commit to promoting, protecting, and ensuring the full and equal enjoyment of all human rights and freedoms of all persons with disabilities, and, to promote respect for their inherent dignity (UN, 2006). To date, 184 countries have ratified this multilateral commitment to protect and reaffirm the rights of persons with disabilities, and 100 countries have ratified its Optional Protocol.

The Irish Government signed the UNCRPD on 30 March 2007 and ratified it on 20 March 2018, becoming the last EU country to do so. Unlike a signature, ratification means that States (Governments) are bound by the terms and obligations contained in the Convention, and thus, can be held accountable for violations of the rights it contains. The UNCRPD does not include a definition of disability, however, the Preamble recognises that "disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others" (UN, 2006, para. 3). Therefore, the UNCRPD moves away from a charity or a medical approach to disability, to a social/human rights approach.

Although all 50 articles contained within the UNCRPD must be considered holistically, as all rights serve to reinforce each other, there are three articles that are especially useful to consider when providing for children's play (Table 3):

Table 3: UNCRPD Articles

Article 30: Participation in cultural life, recreation, leisure, and sport With a view to enabling persons with disabilities to participate on an equal basis with others in recreational, leisure and sporting activities, States Parties shall take appropriate measures: (d) To ensure that children with disabilities have equal access with other children to participation in play, recreation and leisure and sporting activities, including those activities in the school system.
Article 9: Accessibility States Parties shall take appropriate measures to enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.

Articles 7: Children with disabilities

States Parties shall take all necessary measures to ensure the full enjoyment by children with disabilities of all human rights and fundamental freedoms on an equal basis with other children.

To oversee the implementation of the UNCRPD for States Parties, the United Nations Committee on the Rights of Persons with Disabilities (CRPD), a body made up of independent experts, was established in 2008. All States Parties are required to submit regular reports to the CRPD on how the rights are being implemented, initially within two years or ratifying the UNCRPD, and every four years thereafter. The CRPD examines each report and articulates its concerns and recommendations before forwarding these to the State Party concerned as Concluding Observations. Concerns that the obligations to uphold the rights contained within Article 9 (accessibility) were not being addressed prompted the publication of *General Comment No. 2 on Article 9: Accessibility* (CRPD, 2014).

On 11 April 2014, the CRPD adopted General Comment No. 2 (GC2) following an extensive consultation process which including submissions from persons with disabilities, disabled persons organisations (DPO's), national human rights institutions, and other stakeholders. In the opening paragraph of GC2 the CRPD acknowledge that:

> "Accessibility is a precondition for persons with disabilities to live independently and participate fully and equally in society. Without access to the physical environment, to transportation, to information and communication, including information and communications technologies and systems, and to other facilities and services open or provided to the public, persons with disabilities would not have equal opportunities for participation in their respective societies" (CRPD, 2014, p. 1).

They further articulate that "persons with disabilities face technical and environmental – in most cases, human-built environmental – barriers" (CRPD, 2014, p. 1).

While the CRPD identified numerous recommendations to counteract such barriers, they specifically recommended "the strict application of UD to all new goods,

products, facilities, technologies, and services [to] ensure full, equal, and unrestricted access for all potential consumers, including persons with disabilities, in a way that takes full account of their inherent dignity and diversity". It further adds that "all new objects, infrastructure, facilities, goods, products and services have to be designed in a way that makes them fully accessible for persons with disabilities, in accordance with the principles of UD". Moreover, it states that "while the initial application of UD is more economical, the potential cost of subsequent removal of barriers may not be used as an excuse to avoid the obligation to remove barriers to accessibility gradually" and notes that "the application of UD makes society accessible for all human beings, not only persons with disabilities". Thus, UD is considered essential to facilitate accessibility in public playgrounds, and applies to all public playground patrons, not only persons with disabilities.

European Context

Council of Europe Disability Strategy 2017 – 2023

The Council of Europe promotes, protects, and monitors the implementation of human rights for all, including persons with disabilities. The Strategy on the Rights of Persons with Disabilities – Human Rights: A Reality for All – outlines the Council of Europe's priorities in the period 2017-2023 (Council of Europe, 2017). Specifically, the Strategy aims to guide and support the activities carried out by the Council of Europe, its member States (including Ireland) and other stakeholders both at national and local levels, aimed at implementing the UNCRPD (Council of Europe, 2017).

The overall goal of the Strategy is to achieve equality, dignity, and equal opportunities for persons with disabilities and is centred around five rights-based priority areas; these include: (i) equality and non-discrimination, (ii) awareness raising, (iii) accessibility, (iv) equal recognition before the law, and (v) freedom from exploitation, violence and abuse (Council of Europe, 2017). At the outset, the Strategy identifies five cross-cutting issues that need to be considered; these include: (i) participation, (ii) cooperation and coordination, (iii) universal design and reasonable accommodation; (iv) gender equality perspective, and (v) multiple discrimination and education and training (Council of Europe, 2017).

In particular, the Strategy acknowledges that "disability is the result of interaction between individual impairments and existing attitudinal and environmental barriers" (Council of Europe, 2017, p.14). To overcome these barriers, the Strategy specifically endorses "universal design, which benefits everyone" (Council of Europe, 2017, p. 14). Moreover, the Strategy recognises that no one size fits all, and acknowledges that "individually tailored reasonable accommodation" may be required for individuals not met by universal solutions (Council of Europe, 2017, p. 14).

Although the Strategy does not create legal obligations, Ireland, as a member State needs to take into consideration the contents of the Strategy in their legislation, policies, and activities and in all areas of life to improve the lives of persons with disabilities (Council of Europe, 2017). This includes supporting the full participation of all playground patrons, via the provision of universally designed public playgrounds.

European Standard on accessibility and usability of the built environment

The first European Standard on accessibility and usability of the built environment – *EN17210:2021 Accessibility and usability of the built environment - Functional requirements* – was approved by CEN, the European committee for standardisation, on 30 November 2020. This Standard and was corrected and reissued by the CEN-CENELEC Management Centre on 17 February 2021. This Standard (EN 17210) was developed "in response to mandate M/420 of the European Commission, providing a standard for procurement of an accessible and usable built environment" (National Standards Authority of Ireland [NSAI], 2021, p. 6). EN 17210 specifically stipulates that all publicly funded developments (i.e., public buildings and spaces) must provide accessibility and usability across Europe, with the overarching "goal of … contributing to the implementation of the UNCRPD in Europe" (NSAI, 2021, p. 6).

In line with the UNCRPD, EN 17210 endorses the UD concept to support the implementation of accessibility and usability in the built environment (including public play environments). Specifically, Clause 19.2 of EN 17210 provides recommendations for public playgrounds; these recommendations include: (a) access and circulation, (b) spatial organising and planning, (c) surfaces in playgrounds, (d) play elements and equipment, and (e) elements for providing sensory experiences

(NSAI, 2021, pp. 255 – 256). Moreover, in the rationale for Clause 19.2, EN 17210 unequivocally states that "universally designed playgrounds, considering also the requirements of all children regardless of size or ability, provide more opportunities for all children to play, and for social integration" (NSAI, 2021, p. 255). EN 17210 applies to all CENELEC members, which include the national standards bodies and electrotechnical committees from across the continent, including Ireland (NSAI, 2021). The I.S. EN 17210:2021&LC:2021 is the adopted Irish version of the European Standard EN 17210.

To support the implementation of EN 17210, S.*R. CEN/TR 17621:2021 Accessibility and usability of the built environment - Technical performance criteria and specifications* was developed. Also, to assess conformity of the built environment with the functional requirements and recommendations described in EN 17210, *S.R. CEN/TR 17622:2021 Accessibility and usability of the built environment - Conformity assessment* was established. Therefore, conformance with accessibility and usability requirements in public playgrounds in Ireland must be developed and assessed in line with EN 17210, S.R. CEN/TR 17621 and CEN/TR 17622.

Irish Context

Ready, Steady, Play! A National Play Policy

Ready, Steady, Play! A National Play Policy 2004 – 2008 demonstrated the Irish Government's commitment to making sure that equitable and inclusive play is facilitated for all children, particularly children who are marginalised, disadvantaged, or who have a disability (Moloney et al., 2021). Specifically, the National Play Policy (National Children's Office [NCO], 2004) endorsed a UD approach for public play provision, however, no national policies or good practice guidelines were developed to guide this process (Moloney et al., 2021). Moreover, evaluation of the implementation of the National Play Policy focussed on the quantity of playgrounds, play policies, and play officers nationally (Kerrins et al., 2011), rather than a complete and comprehensive evaluation of the interagency approach to achieving all eight objectives of the policy.

Nonetheless, in February 2012, the then Minister for Children and Youth Affairs, Frances Fitzgerald, established the Local Authority Play and Recreation Network

(LAPRN), made up of key Local Authority managers and staff responsible for the local delivery of play and recreation services in communities across the country, to introduce a more coordinated and interagency approach to achieving the main goals of the play and recreation policies at both national and local level (O'Connor, 2014). Despite this more coordinated approach, GC 17 established that "consideration should also be given to the development of a dedicated plan, policy or framework for article 31 or to its incorporation into an overall national plan of action for the implementation of the Convention" (CRC, 2013, p. 20). Thus, for children's play rights to be met in Ireland, a renewed policy dedicated solely to children's play is fundamental.

Disability Act

The Disability Act 2005 became law on 8 July 2005 and is part of the National Disability Strategy (NDS) that was launched in 2004, to underpin the participation of people with disabilities in Irish society (Government of Ireland, 2005). Specifically, Sections 25, 26, 27 and 28 of the Act places a statutory obligation on public service providers to support access to services and facilities for people with disabilities (Government of Ireland, 2005). Under the Act, the term "disability", in relation to "a person, means a substantial restriction in the capacity of the person to carry out a profession, business or occupation in the State or to participate in social or cultural life in the State by reason of an enduring physical, sensory, mental health or intellectual impairment" (Government of Ireland, 2005, p. 6).

Under the Act, the National Disability Authority (NDA) established the Centre for Excellence in Universal Design (CEUD) in January 2007 which is "dedicated to enabling the design of environments that can be accessed, understood and used regardless of a person's age, size, ability or disability" (NDA, 2020). Moreover, under the Act, a service is "a service or facility of any kind provided to members of the public by a public body" including public "use of any place or amenity owned, managed or controlled by a public body" (Government of Ireland, 2005, p. 7). Thus, given that public playgrounds in Ireland are typically owned, managed, and controlled by public bodies (i.e., local authorities) (Moloney et al., 2021), they need to incorporate UD so that they are accessible, understandable, and usable by all patrons.

Equal Status Acts 2000 – 2018

The Equal Status Acts 2000 – 2018 ("the Acts") cover various forms of discrimination, including discrimination on the "disability ground". The Acts articulate that "disability' includes physical, intellectual, learning, cognitive, emotional, or medical conditions, and further communicate that discrimination occurs where there is less favourable treatment of one person compared to another person because one has a disability and the other has not, or the other has a different disability (NDA, 2020). Under the Acts, anyone providing goods or services to the public must do all that is reasonable to accommodate the needs of a person with a disability; this includes providing special treatment or facilities in circumstances where, without these, it would be impossible or unduly difficult to avail of the goods or services (NDA, 2020).

Community Participation (Disability) (Miscellaneous Provisions) Bill (2019)

New draft legislation currently before the Irish Government – *Community (Disability) (Miscellaneous Provisions) Bill* (2019) – promotes the concept of UD as a way of exceeding minimum accessibility standards, as laid out in the existing Building Regulations in Ireland (Part M and the associated Technical Guidance Document (TGD) M), to address barriers faced by persons with disabilities in community environments and improve Ireland's inclusiveness. The proposed bill consists of four main points, one of which includes the requirement of local authorities to build inclusive playgrounds.

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Appendix C: Survey questions for playground professionals

Demographics

Description (optional)

Please list your field of work. Complete "Other" if the list does not adequately describe your field. *

- Community playground planner (e.g., city/ council/ community member responsible for planning playgro...
- Community playground designer (e.g., architect, landscape architect, etc.)
- Community playground provider (e.g., city/ council/ community member responsible for providing playgr...
- Other...

What is your educational background/ qualification? *

Short answer text

How many years professional experience do you have in planning/ designing/ providing community playgrounds? *

- 0 - 5 years
- 5 - 10 years
- 10 - 15 years
- 15 - 20 years
- 20 or more years

In your present employment situation, what is your job title? *

Short answer text

How many years professional experience do you have in this role? *

- ○ 0 - 5 years
- ○ 5 - 10 years
- ○ 10 - 15 years
- ○ 15 - 20 years
- ○ 20 or more years

In which of the following regions do you plan/ design/ provide community playgrounds? *

- ☐ Leinster
- ☐ Munster
- ☐ Connacht
- ☐ Ulster
- ☐ Other...

Terminology and definitions

Description (optional)

When thinking about community playgrounds, what do you understand by the term 'Universal Design'? *

Long answer text

How important is Universal Design for community playgrounds? *

	1	2	3	4	5	
Not at all important	○	○	○	○	○	Very important

Who are universally designed community playgrounds important for? (e.g., age groups) *

Long answer text

In your experience of planning/ designing/ providing community playgrounds, can you please give examples of how you have implemented Universal Design? *

Long answer text

Legislation/ Policy context

Description (optional)

What legislation and/ or policy, that are relevant to universal design and inclusion, govern your practice in your role as a community playground planner/ designer/ provider? *

Long answer text

How does the legislation and/ or policy, that is relevant to universal design and inclusion, impact how you plan/ design/ provide community playgrounds? *

Long answer text

What guidelines (if any), that are relevant to universal design and inclusion, do you refer to when planning/ designing/ providing a community playground? *

Long answer text

Universal Design and community playgrounds

Description (optional)

What percentage of your community playground projects do you/ clients make requests that require knowledge about Universal Design? *

Short answer text

In your role as a community playground planner/ designer/ provider, please answer each question below selecting one answer per row: *

	Never	Rarely	Sometimes	Often	Always
Are you asked f...	○	○	○	○	○
Are implication...	○	○	○	○	○
Universal Desig...	○	○	○	○	○
I keep up to dat...	○	○	○	○	○
I go beyond the...	○	○	○	○	○

In your role as a planner/ designer/ provider of community playgrounds, how often would you prioritise Universal Design over: *

	Never	Rarely	Sometimes	Often	Always	Not Applica...
Cost	○	○	○	○	○	○
Safety	○	○	○	○	○	○
Maintenance	○	○	○	○	○	○
Energy use	○	○	○	○	○	○
Sustainability	○	○	○	○	○	○
Play and pla...	○	○	○	○	○	○

At which point(s), if any, of the design process do you apply Universal Design: *

	Never	Rarely	Sometimes	Often	Always	Not Applica...
Stage 0: Stra...	○	○	○	○	○	○
Stage 2: Pre...	○	○	○	○	○	○
Stage 2: Con...	○	○	○	○	○	○
Stage 3: Dev...	○	○	○	○	○	○
Stage 4: Tec...	○	○	○	○	○	○
Stage 5: Con...	○	○	○	○	○	○
Stage 6: Han...	○	○	○	○	○	○
Stage 7: In u...	○	○	○	○	○	○
Quality Asse...	○	○	○	○	○	○

To what extent do you agree or disagree that the following factors are a barrier to Universal Design in community playgrounds? *

	Strongly disagr...	Disagree	Neutral	Agree	Strongly agree
The cost	○	○	○	○	○
The brief from ...	○	○	○	○	○
The site param...	○	○	○	○	○
Lack of knowle...	○	○	○	○	○
Lack of market...	○	○	○	○	○
No clear imme...	○	○	○	○	○
A perception th...	○	○	○	○	○
Lack of good p...	○	○	○	○	○
Lack of legislat...	○	○	○	○	○

Are there other factors you consider a barrier to Universal Design in community playgrounds?

Long answer text

To what extent are the following important for the planning/ designing/ provision of universally designed community playgrounds? *

	Not at all impo...	Slightly import...	Important	Fairly important	Very important
Good practice ...	○	○	○	○	○
Specific trainin...	○	○	○	○	○
Evaluation tool...	○	○	○	○	○
User involveme...	○	○	○	○	○
Culture of your ...	○	○	○	○	○
Legislative enf...	○	○	○	○	○
Play and play v...	○	○	○	○	○

What would support the implementation of Universal Design in community playgrounds? *
(From the nine options below, please rate on a scale of 1 to 9, from least to most important)

	1 (least ...	2	3	4	5	6	7	8	9 (most...
Good pr...	○	○	○	○	○	○	○	○	○
More s...	○	○	○	○	○	○	○	○	○
Changi...	○	○	○	○	○	○	○	○	○
Introdu...	○	○	○	○	○	○	○	○	○
The use...	○	○	○	○	○	○	○	○	○
Evaluati...	○	○	○	○	○	○	○	○	○
User inv...	○	○	○	○	○	○	○	○	○
Culture ...	○	○	○	○	○	○	○	○	○
Legislat...	○	○	○	○	○	○	○	○	○

Are there additional ideas/ supports not listed that would support the implementation of Universal Design in community playgrounds?

Long answer text

Training

Description (optional)

Would you be interested in taking a course to learn more about the concepts of Universal Design and inclusion and its application in community playgrounds? *

- ○ Yes
- ○ No
- ○ Maybe
- ○ Other...

What about Universal Design, as it relates to community playgrounds, would you like to learn more about? (From the seven options below, please rate on a scale of 1 to 7, from least to most important) *

	1 (least im...	2	3	4	5	6	7 (most im...
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○
Knowledg...	○	○	○	○	○	○	○

What kind of training commitment would meet your training needs? *

- ○ Half day
- ○ Full day
- ○ Longer duration

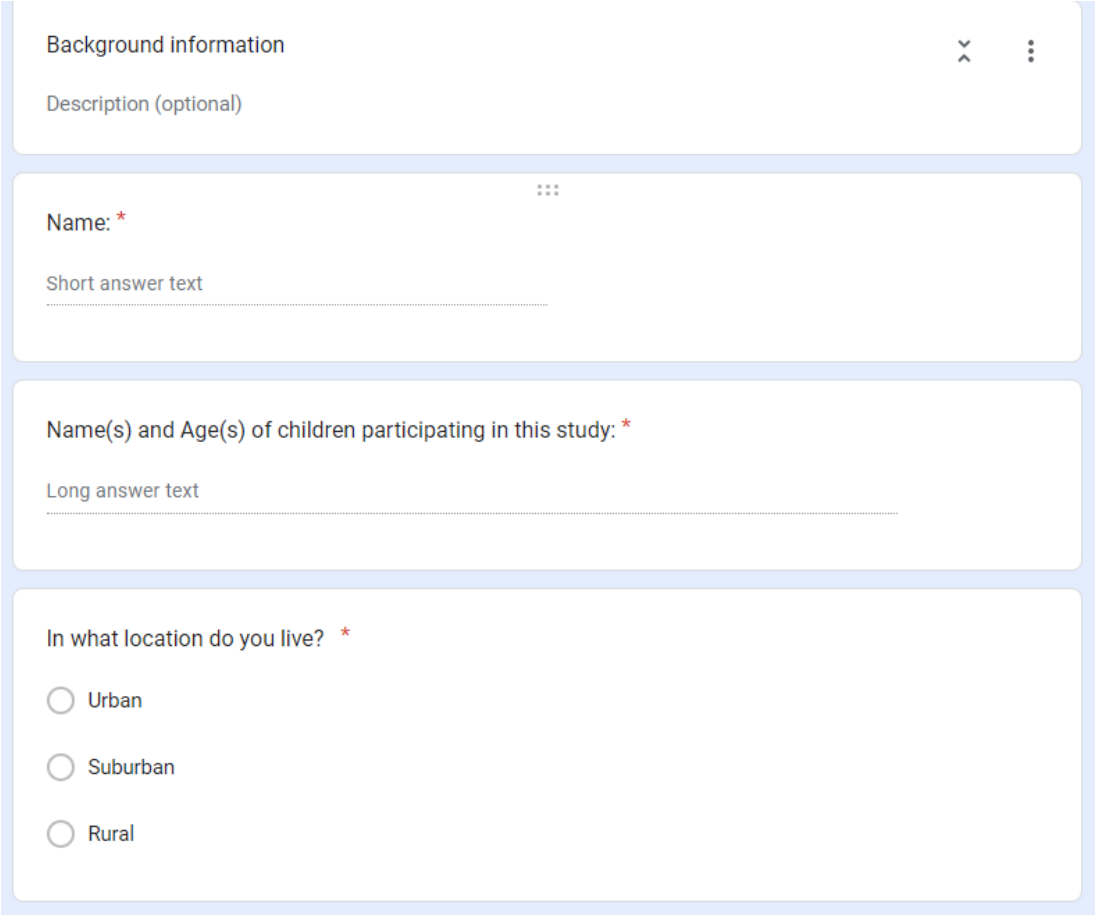
What is your most preferred method for training and development? (From the four options below, please rate on a scale of 1 to 4, from least to most preferred) *

	1 (least preferred)	2	3	4 (most preferred)
In -person training	○	○	○	○
Online e-courses	○	○	○	○
Blended learning (...	○	○	○	○
Reading list and ex...	○	○	○	○

If you have any further comments, please share below:

Long answer text

Appendix D: Survey questions for adults



Playgrounds

Description (optional)

Are there playgrounds near where you live? *

- Yes
- No

Do you and your child(ren) play in playgrounds near where you live? *

- Yes
- No

Do you and your child(ren) travel to play in playgrounds that are not close to where you live? *

- Yes
- No

If you and your child(ren) visit playgrounds

Description (optional)

How often do you and your child(ren) go to playgrounds?

- Daily
- Weekly
- Once a month
- Every 2 - 3 months
- 2 - 3 times per year

Do you and your child(ren) have a favourite playground? (Please name it)

Short answer text

How often do you and your child(ren) visit your favourite playground?

- ◯ Daily
- ◯ Weekly
- ◯ Once a month
- ◯ Every 2 - 3 months
- ◯ 2 - 3 times per year

How do you and your child(ren) usually get to your favourite playground?

- ◯ By foot/ wheeled mobility (e.g., pram, wheelchair)
- ◯ By bike
- ◯ On public transport
- ◯ By car

How long does it usually take you and your child(ren) to get to your favourite playground?

- ◯ Less than 5 minutes
- ◯ 5 - 10 minutes
- ◯ 10 - 15 minutes
- ◯ 15 - 20 minutes
- ◯ 20 - 25 minutes
- ◯ 30 minutes or more

Do you meet people when you visit your favourite playground?

	Yes	No
Friends	◯	◯
Other children	◯	◯
Other adults	◯	◯

Why does this playground appeal to you and your child(ren)?

Long answer text

What do you like to do when you visit your favourite playground?

Long answer text

What does your child(ren) like to do when they visit their favourite playground?

Long answer text

Is there anything about your favourite playground that you would change? If so, why?

Long answer text

If you and your child(ren) do not visit playgrounds

Description (optional)

Where do you and your child(ren) like to play and why?

Long answer text

What stops you and your child(ren) from using playgrounds?

Long answer text

What would you change about playgrounds so that you and your child(ren) would use them?

Long answer text

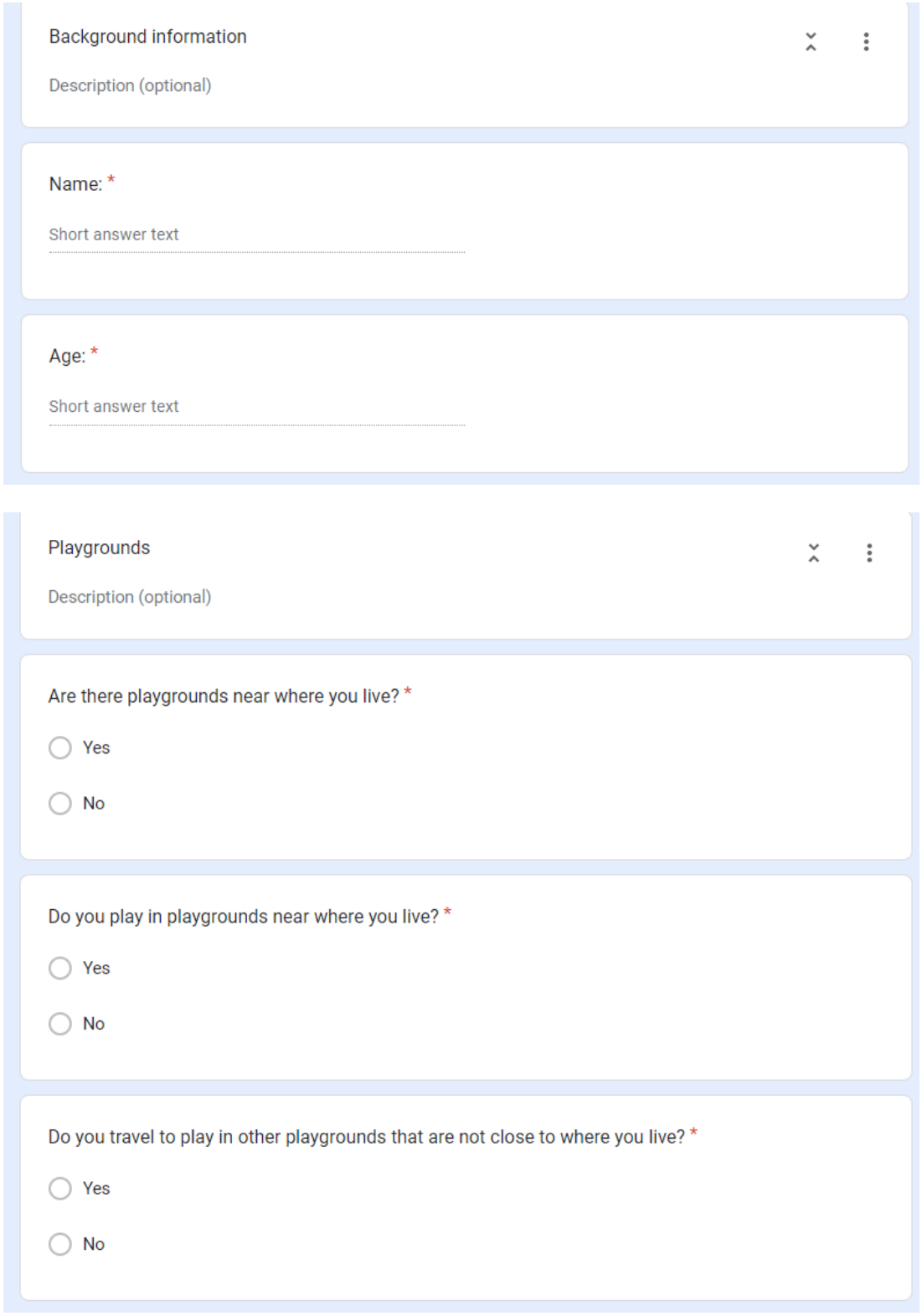
Playgrounds in general

Description (optional)

Do you agree or disagree with the following statements? (Select one answer per row) *

	Agree	Disagree
Playgrounds should be open to ki...	☐	☐
Playgrounds should cater for all a...	☐	☐
Playgrounds should allow for chil...	☐	☐
Playgrounds should allow for chil...	☐	☐
Playgrounds should cater for eve...	☐	☐
Playgrounds must be accessible ...	☐	☐
Accessible and inclusive play mu...	☐	☐
Playgrounds should make everyo...	☐	☐
Playgrounds should provide a wi...	☐	☐
Playgrounds should be as safe a...	☐	☐
Playgrounds should provide oppo...	☐	☐

Appendix E: Survey questions for children



If you play in playgrounds

Description (optional)

How often do you go to a playground?

- Daily
- Weekly
- Once a month
- Every 2 - 3 months
- 2 - 3 times per year

Do you have a favourite playground?

Long answer text

How often do you go to your favourite playground?

- Daily
- Weekly
- Once a month
- Every 2 - 3 months
- 2 - 3 times per year

How do you normally get to your favourite playground?

- On foot/ wheeled mobility (e.g., pram, wheelchair)
- By bike
- On public transport (e.g., bus, train)
- By car
- Other...

How long does it usually take you to get to your favourite playground from where you live?

- ○ Less than 5 minutes
- ○ 5 - 10 minutes
- ○ 10 - 15 minutes
- ○ 15 - 20 minutes
- ○ 20 - 25 minutes
- ○ 30 minutes or more

Do you meet people when you visit your favourite playground?

	Yes	No
Friends	○	○
Other children	○	○
Other adults	○	○

Why is this your favourite playground?

Long answer text

What do you usually do when you visit your favourite playground?

Long answer text

Is there anything you would change about your favourite playground and why?

Long answer text

If you do not play in playgrounds

Description (optional)

Where do you like to play and why?

Long answer text

What stops you from playing in playgrounds?

Long answer text

What would you change about playgrounds so that you can have fun there?

Long answer text

Playgrounds in general

Description (optional)

Do you agree or disagree with the following: *

	Agree	Disagree
Playgrounds should be open to ki...	☐	☐
All adults should be allowed in th...	☐	☐
All children should be able to play...	☐	☐
Everybody should be able to get i...	☐	☐
Everybody should feel welcome i...	☐	☐
Playgrounds should be safe	☐	☐
Playgrounds should be challengi...	☐	☐

Appendix F: Semi-structured interview guide

1. Follow up questions from online surveys to clarify any unknowns (Tell me more …)
2. Follow up questions from creative exercise (designing their dream playground)
    a. Tell me about your dream playground (that you drew/ made etc.) and what you have put in it and why?
    b. How would you make/build your dream playground?
    c. What do you love in your dream playground?
    d. Why would it be your dream playground?
    e. How far would your dream playground be from your house and how would you get there?
3. What would you be able to do in your dream playground?
    a. Why would people use your/go to your dream playground?
    b. What would you put into your playground so that everyone could use it?
    c. Younger/ older children
    d. Adults
4. Who and what would you bring to your dream playground?
    a. Who would you play with in your dream playground?

Appendix G: Information letter for professional experts

Research project exploring the opportunities and challenges for diverse users and non-users to access and participate in community playgrounds



Information Letter

You are being asked to participate in a research project. Please take a few moments to read through this information.

About this research project

The purpose of this research study is to explore and understand barriers and opportunities for diverse users and non- users (child-adult users with and without disabilities) to access and participate in community and playgrounds. In addition, this research seeks to explore the experiences of planners/ designers/ providers in relation to the design and provision of community playgrounds in IRELAND. The study has been reviewed and approved by the UCC Social Research Ethics Committee who have given permission to carry out this study.

What you will be asked to do

You are invited to take part in an electronic questionnaire to explore your experiences of designing/planning/ providing community playgrounds in Ireland. The purpose of this electronic questionnaire is to collect data on practices and processes used to design/ plan/ provide community playgrounds in the Irish context, with a particular focus on Universal Design and inclusion. Members of the Centre for Excellence in Universal Design, of the National Disability Authority, also contributed to the development of this electronic questionnaire.

The procedure involves completing an electronic questionnaire that will take approximately 20 minutes to complete.

Voluntary participation

Participation in this project is entirely voluntary. It is your free choice. You can withdraw from the study at any point up until submission of the electronic questionnaire. After submission, withdrawal is not possible due to the anonymous nature of the electronic questionnaire. Neither your name, IP address, nor place of work will be recorded in the electronic questionnaire. Consent is implied by submission of the electronic questionnaire.

Confidentiality

Your responses will be confidential. To help protect your confidentiality, the electronic questionnaire will not contain any required fields that will personally identify you. Neither your name, IP address, nor place of work will be recorded in the electronic questionnaire. All information collected will be stored in a password protected electronic format.

What will happen to the results of the project

The information gathered in this project will be included in a written report that will be stored electronically (e-thesis). Alice will publish the findings in professional journals and will present the information at conferences and seminars for educational purposes.

About the researcher

Alice Moore is a PhD Student in the Department of Occupational Science and Occupational Therapy, University College Cork. Alice has received funding from the Irish Research Council to conduct this study as part of her PhD studies.

Further Information

If you have any questions or would like further information, please feel free to contact Alice Moore (alice.moore@ucc.ie/ 110341541@umail.ucc.ie). Alice has two research supervisors in the Department of Occupational Science and Occupational Therapy, University College Cork that you can contact also:

- Dr Helen Lynch (h.lynch@ucc.ie)
- Dr Bryan Boyle (bryan.boyle@ucc.ie)

Thank you very much for talking the time to read this information. I hope you consider being part of this research project.

By clicking the 'Next' button you consent to participate in the study as per the conditions outlined above. By clicking the 'Next' button you are confirming that you are aged 18 years plus.

Appendix H: Information Letter and Consent Form for Parent(s)/ Legal Guardian(s)

Research project exploring the opportunities and challenges for diverse users and non-users to access and participate in community playgrounds

Information Letter

As a parent/ legal guardian, you, and your child(ren) are being asked to participate in a research project. Please take a few moments to read through this information.

About the research project

The purpose of this research study is to explore and understand the opportunities and barriers and opportunities for diverse users and non-users (child-adult dyads with and without disabilities) to access and participate in community and playgrounds. Child-adult dyads need to consist of a minimum of one child and one adult (i.e., parent/ guardian).

What you will be asked to do

You will be asked to participate in three phases:

1. Fill in an online survey about playgrounds and the places you play as a family. This will take approximately 15 – 20 minutes to fill in.

2. You and your child(ren) will be asked to complete one survey each; however, you can assist your child if they are having difficulties filling in the survey.

3. After you fill in the survey, you will be asked to design your dream playground with your child(ren) using arts and crafts/ technology/ whatever

you like. The researchers will ask you to send photographs of your dream playground before the third and final phase.

Finally, the researchers will ask to talk to you and your child(ren) online about playgrounds, and your dream playground. This discussion will take approximately 40 – 60 minutes.

Recording of online discussion

If it's OK with you, the researchers will record the online discussion on a computer/ laptop, and on a voice recorder, to ensure that all information is retained.

What will happen to the drawings/ written compositions/ photographs sent to the researchers?

The researchers will ask you and your child(ren) if it is OK to keep and use what you and your child(ren) created for the research.

Voluntary participation

Participation in this project is entirely voluntary. It is your free choice. There is no problem if you decide to be involved and then change your mind later – you can withdraw at any time up to 4-weeks after working with the researchers, without reason.

Confidentiality

Your name or any identifying information about you and your child(ren) will not be used at any time in writing or talking about this project. Only you and the research team (the researcher and her supervisors) will know what you say. All information collected will be kept in a locked cabinet and password secured computer. All names will be changed, and false names will be used on any written material in reporting the findings of the study to ensure confidentiality.

What will happen to the information you give?

Your data will become part of a securely stored database with the data from your child(ren) and other children/ young people and their parents/ guardians. The researchers will use this data to understand the opportunities and barriers and

opportunities for diverse users and non-users (child-adult dyads with and without disabilities) to access and participate in community and playgrounds.

What will happen to the results of the project?

The information gathered in this project will be included in a written report that will be stored electronically (e-thesis). The researchers also hope to talk about the study's findings at conferences / teaching / on the radio and to publish the findings in articles, blogs, on social media and in books.

Who has reviewed this study?

Approval has been given by the UCC Social Research Ethics Committee, and the researchers are Garda vetted.

About the researchers

Alice Moore is a PhD Student in the Department of Occupational Science and Occupational Therapy, University College Cork. Alice has received money from the Irish Research Council to conduct this study as part of her PhD studies. Alice has two research supervisors in the Department of Occupational Science and Occupational Therapy, University College Cork – Dr Helen Lynch and Dr Bryan Boyle.

Further information

If you have any questions, contact Alice Moore (110341541@umail.ucc.ie).

If you would like to take part in the study, please fill in the form on the next page!

Research project exploring the opportunities and challenges for diverse users and non-users to access and participate in community playgrounds

Consent Form for Parent(s)/ Legal Guardian(s)

Name(s):	
Name of child(ren) participating in this study:	
Age(s) of child(ren) participating in this study:	
Relationship to child(ren):	
Email address:	

I understand what the study is about, and it has been clearly explained to me.

I understand that all the information gathered will be kept strictly confidential, which means my name and my child(ren)'s name(s) along with any identifying information will not be included in any written reports, publications, or presentations.

I understand that this research will be available in an electronic thesis (e-thesis) and the researcher also hopes to talk about the study's findings at conferences / teaching / on the radio and to publish the findings in articles, blogs, on social media and in books.

I understand that I along with my child(ren) do not have to take part and that we can stop taking part at any time, without reason.

I understand that I can ask the researchers to delete my and my child(ren)'s information up until 4 weeks after taking part in the study.

Please sign below if you consent to your participation and your child(ren)'s participation in this study.

Signature:

_____

Date:

_____

Thank You!

Appendix I: Information Letter and Assent Form for Child/ Young Person

Research project exploring the opportunities and challenges for diverse users and non-users to access and participate in community playgrounds

Information Letter for Child/ Young Person

Hi! Our names are Alice, Helen, and Bryan, and we are researchers!

Alice is a PhD student in the Department of Occupational Science and Occupational Therapy in University College Cork, and she needs your help …

Why do we need your help?

Alice is doing a research project about playgrounds, and wants to hear all about the playgrounds that you do or do not play in. Your parent(s)/ guardian(s) are also being asked to take part, and if you have brothers/ sisters, they can take part in the study too if they want to.

What you will be asked to do

If you choose to take park, and your parent(s)/ guardian(s) say it's OK for you to take part, you will be asked to:



Fill in a survey on your computer/ tablet/ phone about playing outside and playgrounds. You can ask your parent(s)/ guardian(s) to help you if you want.



After you fill in the survey, you will be asked to design your dream playground with your parent(s)/ guardians using arts and crafts/ technology/ whatever you like and send photographs to the researchers.



Lastly, the researchers will ask to talk with you and your parent(s) or guardian(s) on a video call about playgrounds and your dream playground on your computer/ tablet/ phone.

How will the researchers remember what you say when I talk to them?

If it's OK with you, the researchers will record the online conversation on a computer/ laptop, and on a voice recorder, so they do not forget what you say.

What will happen to the drawings/ written compositions/ photographs sent to Alice?

The researchers will ask you if it's OK to keep and use what you created for the research.

Do you have to take part?

No, it's your choice to take part, so you don't have to if you don't want to. If you change your mind, or do not feel like taking part, you can stop at any time, and you do not have to give a reason. After you have finished, you can still change your mind up until 4 weeks after taking part.

Will your participation in the study be kept confidential?

Yes, absolutely! Your answers will be confidential, which means that no one will know that they are yours. We will use different names when reporting the findings of the study.

What will happen to the information you give?

Your data will become part of a securely stored database with the data from your parent(s)/ guardian(s) and other children/ young people and their parents/ guardians. The research team will use this data to understand why children/ young people and families use or do not use playgrounds and find out what is important so that all families can access, use, and be included in playgrounds.

What will happen to the results of the project?

The information gathered in this project will be included in a written report that will be stored electronically (e-thesis). The researchers also hope to talk about the study's findings at conferences / teaching / on the radio and to publish the findings in articles, blogs, on social media and in books.

Who has reviewed this study?

Approval has been given by the UCC Social Research Ethics Committee, and the researchers are Garda vetted.

Has Alice got money to do this study?

Alice has received money from the Irish Research Council to conduct this study as part of her PhD studies.

Further information

If you have any questions, contact Alice Moore (110341541@umail.ucc.ie). Alice has two research supervisors in the Department of Occupational Science and Occupational Therapy, University College Cork – Dr Helen Lynch and Dr Bryan Boyle.

If you would like to take part in the study, please fill in the form on the next page!

Research project exploring the opportunities and challenges for diverse users and non-users to access and participate in community playgrounds

Assent form for Child or Young Person

Name:

_____

Age:

_____

I understand what the study is about, and it has been clearly explained to me.

I understand that all the information gathered will be kept strictly confidential, which means my name and my parent(s)/ guardian(s) names will not be included in any written reports, publications, or presentations.

I understand that this research will be available in an electronic thesis (e-thesis) and the researchers also hope to talk about the study's findings at conferences / teaching / on the radio and to publish the findings in articles, blogs, on social media and in books.

I understand that I do not have to take part and that I can stop taking part at any time and I do not have to give a reason for this.

I understand that I can ask the researchers to delete my information up until 4 weeks after taking part in the study.

I understand that my parent(s) / legal guardian(s) must also consent before I can take part in the study.

I understand that if I have brothers/ sisters they can take part in the study too if they want to.

Please sign below if you agree to take part in this study:

Signature: _____

Date: _____

Thank You!

Appendix J: Media coverage for project with the Crann Centre

Examples of national and local media coverage for the project with the Crann Centre:

- Debrun, L. (2022, July 13). Ryan Tubridy says 'every village, town and city' needs fully-inclusive playgrounds. *Rollercoaster.ie* https://rollercoaster.ie/lifestyle/ryan-tubridy-fully-inclusive-playgrounds/
- The Ryan Tubridy Show. (2022, July 13). The Ryan Tubridy Show Wednesday 13 July 2022. *RTÉ Radio 1*. https://www.rte.ie/radio/radio1/ryan-tubridy/programmes/2022/0713/1309950-the-ryan-tubridy-show-wednesday-13-july-2022//
- The Ryan Tubridy Show. (2022, July 12). Inclusive playground. *RTÉ Radio 1*. https://www.rte.ie/radio/radio1/clips/22120070/
- Playground for families with neuro-physical disabilities opens at Crann Centre in Cork. (2022, July 06). *Independent.ie* https://www.independent.ie/regionals/corkman/news/playground-for-families-with-neuro-physical-disabilities-opens-at-crann-centre-in-cork-41818402.html
- News Team. (2022, July 04). Crann Centre opens in Ovens. *C103*. https://www.c103.ie/news/c103-news-and-sport/crann-centre-opens-in-ovens/
- Collins, T. (2022, July 03). Ireland's first fully inclusive playground is in cork. *THECORK.IE* https://www.thecork.ie/2022/07/03/irelands-first-fully-inclusive-playground-is-in-cork/
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