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Title	Using Lámh signs in mainstream primary schools: an application of the COM-B model
Authors	Sheehan, Michaela
Publication date	2024
Original Citation	Sheehan, M. 2024. Using Lámh signs in mainstream primary schools: an application of the COM-B model. MRes Thesis, University College Cork.
Type of publication	Masters thesis (Research)
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Download date	2026-11-04 12:17:12
Item downloaded from	https://hdl.handle.net/10468/16414

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Using Lámh signs in mainstream primary schools: An application of the COM-B model

Thesis presented by

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for the degree of

Master of Research

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January 2024

Table of Contents:

Declaration **8**
Acknowledgements **9**
Abstract **10**
Chapter 1 Introduction **12**
1.1 Speech, language and communication needs 14
1.2 Key word signing (KWS) 15
1.3 Benefits of KWS 16
1.4 Training and KWS use 20
1.5 Attitudes 22
1.5.1 Attitudes towards aided AAC 22
1.5.2 Attitudes towards KWS 25
1.6 Lámh 28
1.6.1 Parents, peers and staffs use of Lámh 29
1.7 Inclusive Education 33
1.7.1 Inclusive education in Ireland 34
1.7.2 Attitudes towards inclusive education in Ireland 36
1.7.3 Inclusive education worldwide 39
1.7.4 Stakeholders in inclusive education 40
Chapter 2 Behaviour Change & the COM-B Model **43**
2.1 Behaviour Change 45
2.2 COM-B Model 48
2.2.1 Capability 49
2.2.2 Opportunity 50
2.2.3 Motivation 50
2.2.3 Application of the COM-B model in research 52
2.2.4 Application of the COM-B model in questionnaire design to examine behaviour 55
2.3 Summary and research questions 57
Chapter 3 Methodology **58**
3.1 Research Design 58
3.2 Ethical considerations 58
3.3 Data collection procedures 59
3.3.1 Questionnaire Development 59
3.3.2 Focus Groups 67
3.3.3 Data collection schedule 68
3.4 Recruitment and Participants 69

3.5 Data analysis 71
3.6 Rigour 72
Chapter 4 Results & Discussion 75
4.1 Participant Demographics 75
4.1.1 Teachers 78
4.1.1.1 Questionnaire Participants. 78
4.1.1.2 Focus Group Participants. 79
4.1.2 Special Needs Assistants 79
4.1.2.1 Questionnaire Participants. 79
4.1.2.2 Focus Group Participants 79
4.1.3 Use of Lámh in school environment 80
4.1.4 Activities Lámh is used for 82
4.1.5 Frequency of Lámh use 83
4.2 Findings from COM-B related questions 83
4.3 Capability 84
4.3.1 Psychological Capability 85
4.3.1.1 In order to sign more in school I would have to know more about how to integrate Lámh in to daily activities. 85
4.3.1.2 In order to sign more in school I would have to know more about why Lámh is important and the benefits. 85
4.3.1.3 In order to sign more in school I would have to have a supportive environment. 86
4.3.1.4 In order to sign more in school I would have to know more about the range of signs available. 89
4.3.1.5 In order to sign more in school I would have to know more about the resources available to support the use of Lámh. 90
4.3.1.6 In order to sign more in school I would have to know more about where to access Lámh signs. 91
4.3.1.7 In order to sign more in school I would have to know more about how to support peers of a Lámh user. 91
4.3.1.8 In order to sign more in school I would have to know more about how to support Lámh users. 92
4.3.1.9 In order to sign more in school I would need to have more mental stamina to use Lámh. 93
4.3.1.10 Differences in responses between teachers and SNAs relating to psychological capability. 93
4.3.2 Physical Capability 99
4.3.2.1 In order to sign in school I would have to know more about how to make the Lámh signs. 99
4.3.2.2 In order to sign in school I would have to have the physical skills to make the Lámh signs. 100

4.3.2.3 In order to sign in school I would have to have more physical stamina to use Lámh. 100
4.3.2.4 Differences in responses between teachers and SNAs relating to physical capability 101
4.4 Opportunity 103
4.4.1 Physical Opportunity 103
4.4.1.1 In order to sign more in school I would have to have the materials to support using Lámh. 103
4.4.1.2 In order to sign more in school I would have to have more triggers and reminders to prompt my use of Lámh. 104
4.4.1.3 In order to sign more in school I would have to have more time to integrate Lámh in to the tasks I do. 105
4.4.1.4 In order to sign more in school I would have to have more time to plan Lámh use. .. 106
4.4.1.5 In order to sign more in school I would have to have the ability to earn more money as a result of using Lámh. 107
4.1.1.6 Differences in responses between teachers and SNAs relating to physical opportunity. 107
4.4.2 Social Opportunity 111
4.4.2.1 In order to sign more in school I would have to have more support from others to use Lámh. 111
4.4.2.2 In order to sign more in school I would have to have more people around me use Lámh. 113
4.4.2.3 Differences in responses between teachers and SNAs relating to social opportunity. 114
4.5 Motivation 116
4.5.1 Automatic Motivation 116
4.5.1.1 In order to sign more in school I would have to feel that I want to sign enough. 116
4.5.1.2 In order to sign more in school I would have to believe that signing is a good thing to do. 117
4.5.1.3 In order to sign more in school I would have to feel that I need to sign enough. 118
4.5.1.4 Differences in responses between teachers and SNAs relating to automatic motivation. 119
4.5.2 Reflexive Motivation 122
4.5.2.1 In order to sign more in school I would have to develop a habit of signing. 122
4.5.2.2 In order to sign more in school I would have to develop better plans to sign. 123
4.5.1.3 Differences in responses between teachers and SNAs relating to reflexive motivation. 124
4.6 Barriers 127
4.7 Summary 130
Chapter 5 General Discussion 132
5.1 Clinical Implications 132
5.2 Strengths and Limitations 133
5.3 Future Research 134

5.4 Conclusion 135
References **137**
Appendix A. Ethical Approval **154**
Appendix B. Information Sheet **155**
Appendix C. Informational Video **157**
Appendix D. Questionnaire Consent Form **158**
Appendix E. Questionnaire **159**
Appendix F. Focus Group Consent Form **167**
Appendix G. Focus Group Question List **168**
Appendix H. Results of COM-B Questions 9-11 ..... **169**

Table of Figures

Figure 1 Behaviour Change Wheel (Michie et al. 2011) 47

Figure 2 Components of the COM-B model (Michie et al., 2014) 49

Figure 3 COM-B Model Components 51

Figure 4 Theoretical Domains Framework (Cane et al., 2012) 62

Figure 5 Screening of participants 71

Figure 6 Lámh use in the school environment 80

Figure 7 Activities Lámh is used for in the school setting 81

Figure 8 Psychological Capability Questionnaire Results 84

Figure 9 Physical Capability Questionnaire Results 99

Figure 10 Physical Opportunity Questionnaire Results 103

Figure 11 Social Opportunity Questionnaire Results 111

Figure 12 Automatic Motivation Questionnaire Results 116

Figure 13 Reflexive Motivation Questionnaire Results 122

Table of Tables

Table 1 Multiple Choice Statements and corresponding Coding Categories 63

Table 2 Questionnaire Participant Demographics 76

Table 3 Focus Group Participant Demographics 77

Table 4 Psychological Capability 96

Table 5 Physical Capability 102

Table 6 Physical Opportunity 109

Table 7 Social Opportunity 115

Table 8 Automatic Motivation 121

Table 9 Reflexive Motivation 126

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.

Signed: 

Date: 5th January 2024

Acknowledgements

I would firstly like to thank the Department of Speech and Hearing Sciences in University College Cork for supporting this research.

Thank you to my supervisors Dr. Pauline Frizelle and Dr. Ciara O'Toole who provided support and advice throughout my research. I would like to extend my gratitude for your encouragement, guidance and feedback.

My sincere thanks and admiration to the teachers and SNAs who gave so generously of their time to participate in this study. Without your contribution to the study, it would not have been possible.

To my parents Finbarr and Rebecca, your belief in me and unconditional love and support was a driving force in the completion of this thesis. Thank you to my family, friends and colleagues who have provided unwavering support and encouragement throughout my studies. Your patience and reassurance was, and always will be appreciated.

Finally, to my little sister Neassa. Embarking on the journey of using Lámh in our family as you were growing up has been a pleasure and served as motivation to complete this research and further my career as a speech and language therapist.

Abstract

Background: Children with speech, language and communication needs (SLCN) attending mainstream primary schools often rely on key word sign systems (KWS) such as Lámh to support their communication. However, the success of KWS systems will depend on the consistency in which communication partners use signs and the potential for changing their behaviour in a positive light. In this case, communication partners include teachers and special needs assistants (SNAs) as they most frequently interact with children in school. One model developed to change people's behaviour is the Capability, Opportunity, Motivation and Behaviour (COM-B) model. In this study we apply the COM-B model, to explore how we can potentially increase the use of signing by teachers and SNAs in mainstream school by ascertaining what factors influence use of Lámh. This study will also examine what similarities and differences are evident in how these factors of capability, opportunity and motivation influence teachers' compared to SNAs' use of Lámh in the classroom setting.

Method: Teachers (n= 55) and SNAs (n=36) who currently has or previously had a child who uses Lámh in their class in mainstream primary school participated in this study by completing an online questionnaire that targeted each of the components of the COM-B model. Four focus groups (n=16) were also held to explore the findings in further detail, 2 groups of teachers and 2 groups of SNAs. Data was collected in the latter half of the academic year and subsequently analysed using descriptive statistics and qualitative content analysis, employing a deductive approach based on the theoretical framework of the COM-B model.

Results: There are numerous factors within the components of the COM-B model that impact teachers and SNAs use of Lámh in the school environment. Overall, teachers and SNAs indicated that they would need increased psychological capability, specifically 65% stated they would need to know how to integrate Lámh, 62% would need increased knowledge of the importance and benefits of Lamh and 59% would need a supportive environment. Eighty five

percent of teachers and SNAs noted that they required the materials to support their use of Lámh and 78% of participants felt triggers and reminders would be a relevant component of physical opportunity. Social opportunity in the form of support from others and use of Lámh by others were central to the establishment of a whole school approach to using Lámh. Both reflexive and automatic components of motivation were important factors, specifically developing the habit of signing (87%) having to feel the desire to (84%). Finally, there were numerous barriers encountered by staff, including time and training which can be classified within physical opportunity and psychological capability. Overall, teachers and SNAs demonstrated similar levels of responses across the subcomponents of the COM-B model. Some differences were evident in social opportunity, reflexive motivation and psychological capability specifically.

Conclusion: The application of the COM-B model has identified what components require attention when considering effective behaviour change relating to teachers and SNAs use of Lámh in the mainstream environment. To increase signing in a mainstream school environment and alter the behaviour of teachers and SNAs, the components outlined need to be addressed. The findings of this study will help inform the content of a school specific Lámh training course and resources for teachers and SNAs working with Lámh users in a mainstream environment.

Chapter 1 Introduction

Some children present with a range of speech, language and communication needs (SLCNs) (Parkinson et al., 2000). This may be due to a specific diagnosis, for example, intellectual disability. Communication difficulties have the potential to impact a child's progress in a multitude of areas, including social, emotional and educational development (Dockrell & Howell, 2015). It is important that regardless of communication skills, children are supported to access and engage with their education. Changes to law and policy in Ireland and internationally in the last decade has altered the way that children with disabilities such as Down syndrome and autistic children, access education (Murphy et al., 2022). Many children with disabilities access education in an inclusive, mainstream environment. Some of these children will rely on augmentative and alternative communication (AAC) such as KWS to support their communication and engagement with others (Glacken et al., 2019). Lámh is the KWS system used in Ireland, where the keywords in spoken language are supplemented with manual signs (Byrne et al., 2019). To fully support Lámh users in a mainstream primary school environment, staff including teachers and SNAs need to be fully informed in how to use Lámh. This study aims to use the Capability, Opportunity, Motivation- Behaviour model (COM-B) to identify factors that would influence staff in their use of key word signs (KWS) with children who use Lámh in mainstream primary schools. This current chapter introduces the research topic and provides background to the study in terms of KWS, potential Lámh users and inclusive education. The COM-B model is presented in Chapter 2, while Chapter 3 outlines the methodology used. The thesis is concluded with Chapters 4 and 5 where the results are presented alongside discussion of study findings, strengths and limitations. The discussion will include the implications for future practice and outline potential opportunities for research in the future.

To preface, it is important to note there is ongoing debate worldwide regarding the use of language to describe the experience of disability. The language we use has changed as a result of the evolution of the concept of disability (National Disability Authority (NDA), 2022). When using person-first language, the individual is mentioned before the impairment e.g. “people with disabilities”, “person with autism”. Rather than emphasizing an individual's impairment, identity-first or social model language aims to highlight the challenges that people face in society and the environment e.g. “autistic person”. Both are valid and recognised terms, and different populations have varying preferences. This was outlined in the NDA’s consultation with the Disabled Person’s Organisations (DPO’s) in 2021, where stakeholders with an intellectual disability preferred person-first language for example. Some autistic people believe that language that prioritizes identity better represents and honours neurodiversity (Crocker & Smith, 2019). It is important to acknowledge this current issue and take a contextualised, flexible approach in the use of such language for the purpose of this study (NDA, 2022). Therefore the following terms will be used throughout this study in attempt to best represent the preferences of different populations:

- “person/people with intellectual disabilities”
- “autistic person/people”.

Similarly, the term ‘mainstream education’ and what this may entail is subject to widespread debate in Ireland and indeed worldwide. The educational settings accessible to children in Ireland are currently 1) ‘mainstream school’, 2) special school and 3) special class within a mainstream school (Rose & Shevlin, 2020). A ‘mainstream school’ is typically a child’s local primary school, which caters for children with special education needs alongside children without special education needs in a regular classroom setting. Appropriate accommodations are made to support children where necessary. A special school is a separate setting where only

children with special educational needs attend. Finally, a special class within a mainstream school is a separate class within the school for those with special educational needs.

To support inclusive education for people with disabilities at all levels nationwide, Ireland adopted the UN Convention on the Rights of Persons with Disabilities (CRPD) in 2018. Facilitating the effective participation of individuals with disabilities in the educational process is the ultimate aim of an inclusive education system. The term 'mainstream school/education' will be used to describe primary schools that strike to be inclusive by aiming to cater for all children, both with and without special educational needs for the purpose of this study.

1.1 Speech, language and communication needs

Speech, language and communication needs (SLCN) is an overarching term that describes a range of communication difficulties that could include developmental language disorder, speech sound disorder or dysfluency (Law et al., 2019). Communication is about the exchange of information via verbal or nonverbal means. Nonverbal communication describes the use of gestures, facial expression and body language (Hapsari, 2023). The use of key word signing (KWS) relies on the use of such nonverbal communication. Children that have speech, language and communication difficulties can face significant challenges within different aspects of their life including social and emotional development but also within the context of their education. Considering the examples provided above, children may struggle to produce speech sounds, follow verbal instructions, express themselves, narrate an experience, communicate with peers, or speak fluently (Bishop et al., 2017). Such children rely on other means of communication to support their skills, including use of KWS, to support their communication and educational needs. Children with certain diagnoses including intellectual disability or developmental language disorder typically face lifelong speech, language or communication difficulties which can impact their social and academic development. The use of KWS is often a beneficial support.

1.2 Key word signing (KWS)

Children with disabilities may experience speech, language and communication difficulties that impact on engagement in social, educational and recreational scenarios (Royal College of Speech and Language Therapists (RCSLT), 2016). Smith et al. (2020) found that 57.9% of selected cohort of adults with an intellectual disability in Ireland presented with communication difficulties. An important aspect of the role of a Speech and Language Therapists (SLTs) is to promote inclusive communication and support service users and their families (RCSLT, 2016). When planning intervention, it is necessary to identify the strengths and weaknesses of each person individually, and capitalise on such strengths (RCSLT, 2016). One method of supporting communication that is effective for people with disabilities is KWS. KWS involves a combination of manual signs accompanied by speech to support the key words in spoken language (Byrne et al., 2019; Rombouts et al., 2020). Not all words in a sentence are signed, for example, using key word signs (KWS) for the words 'you', 'open' and 'door' in the sentence 'can you open the door?'

KWS is a form of Augmentative and Alternative Communication (AAC). AAC supports people to communicate their needs, wants, feelings and choices using either aided, or unaided strategies (Beukelman & Mirenda, 2013). Aided AAC requires physical support, for example, a device, visuals or real objects, while unaided AAC does not require anything external to the body. KWS is a form of unaided AAC and is regularly used as an intervention by SLTs (Cologan et al., 2018). KWS systems are used worldwide, and these unaided gesture systems are derived from naturally occurring sign language, with each KWS system corresponds to the signing system used locally (Cologon & Mevawalla, 2018; Glacken et al., 2019) such as Irish Sign Language (ISL), American Sign Language (ASL) or British Sign Language (BSL). 'Makaton' is the KWS system used in the United Kingdom (https://makaton.org/) and a derivative of this is also used in Australia known as 'Key Word

Sign Australia' (https://kwsa.org.au/). The key word singing system in the United States of America is referred to as 'Key Word Sign'. Lámh is the manual KWS system used in Ireland, to support people with intellectual disability and/or communication difficulties (https://www.lamh.org/).

KWS relies on the basis of gestures which is of support to people with communication difficulties across the lifespan. Different types of gestures yield different outcomes (Vallotton et al., 2015). Didactic gestures include pointing or tapping which can indicate towards a physical object. Referential gestures typically represent something we are explaining or defining with intentionality. Another gesture type is iconic, where gestures have a visually similar relationship to the object or action they are portraying. Iconic gestures are semantically aligned to the co-occurring speech. KWS builds on this iconic nature of gestures (Rombouts et al., 2020). Gestures are typically a prerequisite to verbal language, with infants producing more gestures than spoken words when communicating in the first year of life (Volterra et al., 2018). While the reliance on gestures begins to decrease around twenty months of age when verbal communication develops, children with communication difficulties in particular may rely on this for a longer period of time, to support their expressive language (Volterra et al., 2018).

1.3 Benefits of KWS

Research shows the use of KWS can promote increased intelligibility, due to the high iconicity of KWS. This has a positive impact on expressive language. Powell & Clibbens (1994) investigated the use of KWS as a method of improving speech intelligibility in adults with Down syndrome. A purposive sampling strategy was followed and 4 male participants from local resource centres who were in receipt of SLT services were selected. The participants were filmed in signing situations involving a conversation with a familiar person. One condition involved KWS with speech (video and audio) while in the other, participants just did

the KWS without the speech (video with no audio). The videos were then rated for intelligibility by four raters. One rater was an SLT that knew signs, the second was an SLT working in a different setting with no sign knowledge and the final two were 'naïve' listeners as they did not have any sign or speech and language therapy knowledge. The authors found that speech accompanied by KWS was rated as more intelligible by the participants than speech alone, regardless of whether the adult raters had any prior knowledge of signing (Powell & Clibbens, 1994). The mean difference was 12% in favour of the KWS condition. Notably, the 'naïve' listeners and the skilled rater with no sign knowledge both agreed on rating for all signs that were more iconic. The authors outline that the use of KWS which are more iconic in nature would be more easily understood by the general public and therefore support communication attempts of people with Down syndrome.

The use of KWS is linked to improved symbol acquisition and comprehension skills for children with disabilities, including ASD. Wendt (2009) completed a systematic review analysing the research relating to use of manual signs and graphic symbols for children with ASD. The authors briefly summarise the evolution of using manual signs and visuals over the years and note the important development of a 'total communication' approach, ensuring that manual sign was used in combination with speech (Mirenda & Erickson, 2000). Two components of this systematic review including focus on the acquisition and production of manual sign and gestures in children (Wendt, 2009). There were twenty-one studies included in this particular section of the review. Wendt (2009) draws our attention to an early study by Carr et al. (1978) who describe the impact of a training procedure on sign production tasks. Four participants with a diagnosis of ASD were involved in this study, two 15 years old, one 14 years of age and a 10 year old. Two types of sessions were completed in this study, training and test sessions. Within the training sessions, the participants were taught the sign for one common food item out of a total of 5. In the test sessions, the child was presented with all 5

objects to assess correct signing. This process was repeated with each child being taught a new sign in consequential training sessions and assessed again in the test session, with differentiation also being assessed as the number of signs increased. The process of incorporating prompting, fading and rotation, was highly effective for 100% of the participants, all demonstrating increased sign production by the final sessions. Although Carr et al. (1978) is now dated, the systematic review of research relating to sign-based intervention for children with ASD by Wendt (2009) is still relevant. There was notable evidence for enhanced symbol acquisition and improved comprehension associated with manual sign intervention such as KWS (Wendt, 2009). This area of research has only developed positively over time.

KWS is used for people across the population. One cohort that may use KWS is people with Down syndrome. Children with Down syndrome are introduced to KWS systems from a young age. This has proven to support their speech and language development as gestures are identified in research as a strength of those with Down syndrome (Zampini & D'Odoroci, 2009). The effects of KWS in children with Down syndrome was investigated by Launonen (1996). This was a longitudinal study over the course of 8 years whereby sampling was purposive in nature. Twelve children with Down syndrome between the ages of 12 months and 3 years were in the control group. This included 3 males and 9 females. A further 12 children with Down syndrome ages six months to three years old comprised the intervention group, 6 male and 6 female. The focus of the intervention programme included manual sign, gesture and actions. The intervention took place over a 2 and a half year period, with family sessions also taking place where families jointly attended 25 sessions. Each child then received an individual appointment with the SLT biweekly. To explicitly make use of signs, parents were advised to have daily training sessions in addition to signing in daily situations. The children were evaluated every six months from age 1 to 3 years and follow up assessments were completed subsequently at age 4 and 5. At age three, the children in the intervention group had

as large a vocabulary (signed and spoken). During a follow up when the children were aged 3 to 5 years old, the intervention group were more advanced than the control group in terms of their speech, language, social behaviour, self-help, cognitive and motor development. Interestingly, a further follow up was completed with the same children who were now 8 years old, five years post intervention by Launonen (1998) and a significant difference was still evident between the groups in terms of social and linguistic skills. While the sample size was limited in this study, the results support the belief that introduction of manual signs during early interactions have the potential to employ long term benefits for children with Down syndrome (Launonen, 1998).

Some research recommends the use of KWS with autistic children, where core signs can be incorporated in a variety of activities ranging from play to table top work to everyday communication interactions. Tan et al. (2014) investigated the acquisition and generalisation of KWS by three autistic children. Similar to Launonen (1998), the sample of this study was small but purposive in nature, as participants were identified as autistic and candidates to use KWS. The three participants were aged between 3 and 4 years old. The intervention was introduced in three phases. There were 3 cupboards, A was the baseline. In phase one, the clinician modelled use of KWS in play with toys in cupboard A for example, ‘do you want more’, more was concurrently signed. Play using toys from cupboard B and C followed but KWS was not used, keeping in line with baseline conditions. In phase 2, KWS was modelled by the clinician during play with toys from cupboards A and B, with no modelling for cupboard C. In the third and final phase, KWS was modelled by the clinician for toys from each cupboard A, B and C (Tan et al., 2014). The follow up session took place two weeks later and involved two activities, the first at baseline conditions and the second with modelling of KWS. This supported the researchers to measure the generalization of signs. Two of the participants demonstrated statistically significant increases in the use of core signs from baseline to

intervention. All three children however generalized the use of core signs from play with toys from Cupboard A to toys in B and C for which no modelling had been given. It is important to note that the sample size in this study serves as a limitation however, in the context of this research, it was evident that KWS had the potential to act as a tool to support children with communication difficulties, as their repertoires of core sign vocabulary increased after nine KWS sessions. Providing modelling of a sign in the target vocabulary is a positive addition to enable the clinician to follow the child's lead and capitalise on core vocabulary that perhaps is of interest to the child.

1.4 Training and KWS use

Levels of training can influence communication partner's level of KWS use. Rombouts et al. (2016) completed a study whereby 12 adults with ID were involved in a dyadic interaction with two professionals 1) with full KWS training (e.g., SLT) and 2) support staff who were not trained in KWS. Both the communication partners' usage and attitudes were analysed. Use of KWS was analysed by coding signs as they were used within the recorded interactions. Moreover, a survey was utilised to gather information on the communication partners' attitudes towards the use of signs in the interactions they engaged in. The results of this study highlighted that the likelihood of staff to use AAC such as KWS may be dependent on the level of training received, as support staff used KWS less often (Rombouts et al., 2016). Similarly in the study by Byrne et al. (2019) staff reported the need for accessible training sessions to adequately equip them with the knowledge and skills to use KWS. Both studies by Rombouts et al (2016) and Byrne et al. (2019) highlight that increased training leads to increased use of KWS. This is important as it shows the relevance for provision of regular and high level training in order to implement successful communication supports. While a similar critique of a small sample size can be applied in this study, the findings are still of important consideration.

The knowledge and practice of communication partners such as teachers is important for successful implementation of AAC. Patel and Khamis-Dakwar (2005) investigated the impact of an AAC training programme on teacher's knowledge practices and barriers to AAC. Twenty teachers in special education in Israel participated in this study. Participant ages ranged from 25 years to 56 years, with three male and seventeen female teachers. A questionnaire was administered pre and post training to the participants. Interviews were also conducted post training to further explore what changes, if any, there had been in relation to teachers practices and knowledge of AAC. The training teachers received included twenty five weekly sessions that lasted four hours, followed by individual supervised sessions in the classroom setting. The results showed an increase in the teacher's level of knowledge surrounding AAC post training. In the pre training questionnaire, teachers did not identify the benefits of AAC to reduce frustration and support social development however 80% noted this in the post training questionnaire (Patel and Khamis-Dakwar, 2005). Teachers also reported increased use of AAC in their classroom post-training. Teacher's attitudes towards AAC also shifted. Before the training, 60% of teachers felt using AAC would negatively impact speech development whereas post training, no teacher reported this as a concern (Patel and Khamis-Dakwar, 2005). Teachers also highlighted that families and other communication partners need to access similar training in AAC to effectively implement best practice of AAC with the children they worked with (Patel and Khamis-Dakwar, 2005).

However, it is not just access to training that presents a barrier to regular implementation of a KWS system. Some evidence in recent research highlights the importance of training follow up and support to promote increased sign retention for communication partners. Smidt et al. (2019) completed a study in Australia to analyse learning and retention of KWS with parents and teachers of children with developmental disabilities. The authors note that KWS was used commonly in Australia, however there was little evidence to date

supporting the process of how communication partners learn to use KWS (Smidt et al., 2019). The study sought to establish whether 1) participants learn signs at a one-day training, 2) participants retain these signs 6 and 12 weeks later and 3) what factors supported the learning and retention of signs (Smidt et al., 2019). Twenty-one participants were involved, 19 female and two male where the average age was 38. All participants were communication partners of someone who uses KWS, thus employing a purposive sampling strategies. All participants and had to attend a one-day KWS workshop in which 100 signs were taught. Participants receptive and expressive sign skills were assessed at 4-time points; pre workshop, post workshop, 6 weeks post workshop and 12 weeks post workshop. There was a statistically significant increase in the participant's knowledge of KWS both receptively and expressively after the workshop. There was a notable decrease between post workshop and the 6 week follow up, however no further loss of knowledge was noted by the 12 week follow up. Interestingly, the participants had higher expressive sign skills compared to receptive during both follow up stages (Smidt et al., 2019). To summarise, the participants gain in sign knowledge changed from 33% pre workshop to 76% post workshop and dropped to 62% by the follow up stages (Smidt et al., 2019). Participants also had the opportunity to engage in a feedback interview following the 12-week period. In these interviews, participants outlined the need for regular practice to support sign knowledge retention. Some participants that attended with colleagues outlined the benefits of having such colleagues as a support when practising KWS. While this was a small-scale study, the results here highlight the importance of continued up to date training for parents and teachers using KWS. Maintenance of sign knowledge can be a challenge, one that needs to be monitored and addresses.

1.5 Attitudes

1.5.1 Attitudes towards aided AAC

Teachers are a key communication partner for children that use AAC. Research highlights the differing opinions of teachers in relation to using AAC. Radici et al. (2019)

completed a study using an online survey, regarding teachers in Italy and their attitudes towards AAC use in primary school. The participants were divided into two groups (1) teachers who had experience using AAC (n= 39) and (2) teachers that did not (n=49). Participants with and without experience using AAC outlined some contrasting views on the benefits and barriers of AAC. Those with experience outlined the benefits of AAC to manage problem behaviour. The more inexperienced group however identified improved communication as the most frequent benefit of AAC use. Both groups identified integration in the classroom and increased autonomy for the AAC user as further benefits to incorporating AAC in the classroom environment. There was an interesting difference in responses about barriers between the two groups. Teacher with experience of AAC identified use with teachers and peers as the biggest barrier whereas those without experience provided frequent comments about the inability to comment on the barriers due to their lack of knowledge in the area of AAC. The authors note that the key difference between the responses of the two groups was the level of training (Radici et al., 2019). Those with more training had a different perception of the barriers and facilitators of AAC use. The findings in this study support the view that teachers lack specific training for AAC. Only 8 teachers from a total of 88 reported they received specific training even though 39 teachers had experience using AAC in their class. Whether the training was formal or self-led acquisition of knowledge, it had an impact on teachers' perception of the barriers and facilitators of AAC use. This is consistent with the literature reporting lack of training as a significant limitation in the use of high- or low-tech AAC in the education system today and the current quality of specialist training available (Murphy et al., 2022; Radici et al., 2019). Without the knowledge or opportunity, teachers may not implement AAC as effectively as they should.

Further research looked at the use of AAC in the classroom for children with disabilities. Aldabas (2021) completed a study where 172 teachers in special education in Saudi

Arabia completed two surveys to gather information regarding the barriers and facilitators of using AAC in the classroom with children who have disabilities. Of this cohort, only 42.5% had experience using AAC, and an even lower percentage (31.4%) had attended any training programmes related to AAC. The aims of this study were to look at the different barriers to AAC use, (1) skills and knowledge related to AAC, (2) school environment and (3) the potential student barriers. Difficulty in obtaining high- or low-tech AAC was identified as the biggest barrier with the highest mean score (3.81). Followed by this was lack of family collaboration and difficulty in sourcing and attending training related to the area of AAC. In relation to the school environment, lack of awareness of AAC programmes in school was one of the top four barriers (Aldabas, 2021). Lack of availability of professionals like SLTs and limited collaboration was also identified. Barriers relating to students themselves were mainly concerned with the risk of a student causing damage to high tech AAC devices and refusal of students to use AAC. The final section of the second survey looked at the participant's perception of facilitators to AAC use. There were high levels of agreement on the value of certain facilitators. Examples include having a special room for AAC, providing AAC support and having support at an affordable price. The provision of training programmes related to AAC was noted to be a facilitator, in addition to providing awareness of such programmes to staff and families. This study by Aldabas (2021) noted that lack of teacher training, can prevent implementation of AAC use in the classroom setting. The lack of consistent implementation of AAC, ongoing support and classroom contexts all form barriers to using AAC in the classroom and staff need to create communication opportunities for AAC users to participate to promote generalisation of its use across the educational setting (Aldabas, 2021). Staff play some role in carrying the responsibility to translate research into practice when implementing AAC and make adjustments to best suit their students' needs.

1.5.2 Attitudes towards KWS

There is limited research related to the use of unaided AAC, including KWS specifically. McDowell and Bornman (2022) investigated the use of KWS by 101 special education teachers in South Africa, with one focus of their study placed on the attitudes towards KWS. The participants were 96% female ranging in age from 24 to 65 years of age and mixed between public and independent school settings. The experience in special education ranged from 7 to 29 years. The participants completed a paper based survey, which focused on the perception of the usefulness of KWS in the classroom, teaching strategies applied to facilitate this and the team support use KWS. The survey also focused on both extrinsic and intrinsic factors to KWS use. The results were analysed using descriptive statistics and thematic analysis. Use of KWS ranged from an average of seldom (9%) to always (50%) within the classroom for both school settings. Signs were used less frequently outside of the classroom setting ranging from never (1%) to always (31%). Participants were asked using a 5-point Likert scale (where 5 is most useful), what is KWS most useful for and average scores represented by 'M'. Teachers felt KWS was most useful to support receptive language (M=4.08) and least useful to prepare students for transitions (M=3.43). Teachers also felt that it was beneficial to support language barriers, given that South Africa is a highly multilingual country (McDowell & Bornman, 2022). When asked how they currently use KWS, the most popular responses chosen were using signs with spoken words, using signs with spoken words and pictures, using signs in a structured activity and using signs with the weekly theme in class. Participants were then asked to outline their experiences of collaboration to use key word sign and who provided the most support. The public schools have in school access to SLTs, which resulted in a rating of 3.99 for SLTs, followed by teacher colleagues (M=3.62). Independent school teachers however perceived the principal (M=4.14) to provide the most support followed closes by fellow teachers (M=4.13). Both independent and public school teachers felt parents gave the least support with an average rating of (M=2.73). Finally, teachers were asked

to identify the intrinsic and extrinsic challenges relating to using KWS in school (McDowell & Bornman, 2022). The challenges ranked from highest to lowest include communication partners not encouraging the use of sign, difficulties making signing a habit, unsure of how to create opportunities for sign use and not always having time. These factors can be mapped to the COM-B model (Michie et al., 2014) as both social and physical opportunity in addition to motivation are relevant in their use of sign. The most common extrinsic barrier to using KWS for the public school staff was untrained staff (M=3.46), followed by motor disability and the inadequacy of the school curriculum to support KWS (M=3.11). Independent school staff felt motor disability was the biggest barrier to use of KWS (M=3.20), followed by untrained staff and lack of funding for training (M=3.07). Participants finished this survey by outlining their knowledge, skills and needs in relation to KWS. Teachers from both school settings utilised books and manuals or in service training the most to increase their knowledge. Interest in additional training was indicated by 88% of participants overall.

There has been further research that investigated the attitudes related to the use of KWS in mainstream school settings. Teachers' attitudes towards KWS in mainstream schools with children with learning disabilities in Indonesia was investigated by Sheehy and Budiyanto (2014). Sixty-nine teachers, where 71% worked in a mainstream school, completed a questionnaire. Twenty-two teachers also took part in an interview process. Sixteen special school teachers, three therapist and one deaf school teacher were also included in this study to allow for comparison between mainstream and special school educators. Seventy seven percent of participants had no training related to signing. The attitudes were positive for the majority of participants, and the general consensus was that signs can encourage speech and are relatively easy to use. Eighty four percent of participants in the questionnaire believed signing is enjoyable and 91% felt it encourages speech. These findings were associated with the need for training according to the authors, as participants in the mainstream cohort felt that signing

training should be part of the in-service training they receive (Sheehy & Budiyanto, 2014). Thematic analysis was conducted to analyse the interview responses, where three key themes emerged. The first theme can be summarised as stigma. While most participants felt that signing would not result in stigmatisation for children, they were aware that other people with less knowledge may associate a stigma with sign use. The second theme was related to the nature of signing and its use in the classroom. Some teachers felt that signs were iconic and they could use them informally as a result. Beliefs about the impact of signing on speech were shared, many participants (57%) felt it could promote speech but 7% felt it would hinder speech development. Some also felt that signing would not necessarily be harmful to speech development but equally it would not promote it (Sheehy & Budiyanto, 2014). Overall, the interview results mirrored the findings of the questionnaire, but some participants did mention the potential impact that development of technology may have on manual use of signs, with high tech forms AAC having the potential to take over as they may present as a more attractive and engaging option (Sheehy & Budiyanto, 2014). However, others noted that it will always be an accessible form of communication.

The benefits of KWS as a communication partner intervention has also been investigated. Cologan and Mevawalla (2018) reviewed the use of KWS as a potential communication partner intervention for preservice early childhood teachers. Participants included 196 preservice teachers, 193 females and 3 males where purposive sampling was adopted. The participants were taught 80 KWS and then asked to develop ideas for implementing KWS in early childhood settings. Following thematic analysis, emergent themes were extracted and discussed. Participants felt that KWS would benefit shared communication and language development. The results also highlight the perceived benefits to facilitate inclusion in preschool. Participants reported positive attitudes to using AAC in the classroom and shared an interest in furthering their knowledge in order to fully implement such AAC

systems including KWS. As the generation of ideas for implementation of KWS was just theoretical in this instance, perhaps the study by Cologan and Mevawalla (2018) would have been more substantial had there been a follow up with participants after a period of trialling the suggested ideas put forward.

1.6 Lámh

Lámh is the Irish KWS system. Lámh was developed in the early 1980s in order to have a unified, standardised, Irish-based approach to signing for those with intellectual disabilities and communication needs. There are currently 9 Lámh training programmes available in Ireland (Lámh, n.d). Little Lámh in a workshop for families who have babies or young children that may benefit from using Lámh. Little Lámh teaches participants 26 key signs. The Family Lámh course is designed for parents, siblings and grandparents to provide skills to support Lámh use in addition to 152 signs. Part Two Family Lámh is also available which builds on the Family Lámh course providing 100 additional signs. Module One covers 100 signs and is often utilised by those working with children or adults that use Lámh, this includes teachers, SNAs, social care works and preschool staff for example. Furthermore, the Module One Add-On Workshop is available in two forms, one targeted at those supporting children and one for those supporting adult Lámh users. The adult version of this teaches participants a further 60 signs specific to the adult population. The Quality and Qualifications Ireland (QQI) Level 5 course 'Using Lámh in a Total Communication Approach' is appropriate for those that use Lámh extensively in their work, covering 400 signs and a revision of the 100 Module One signs. The final two courses available include the Lámh Family Trainer Programme and the Lámh Tutor Programme. While there are training courses available for school staff to attend, there is currently no specific Lámh course that caters for all the relevant core school related vocabulary a child may need in a school environment.

Lámh was identified as a research priority by the Department of Health and Children in 2010 due to the lack of research into its use. Consequently, there are some studies outlining the use of Lámh in Ireland. Byrne et al. (2019) completed a study within an Irish context to determine the level of Lámh used in an Irish disability service. Two hundred and seventeen participants including service staff in residential settings and school staff who worked in an Irish disability service, completed a questionnaire relating to their use of Lámh with service users. The majority (74%) of participants said that they were currently supporting a Lámh user. Of this, 92% highlighted they would like to learn additional signs. The results also indicated that 53% of staff reported they used Lámh signs across all activities compared to 79% of special school staff. This indicated the high rate of signs used by staff within the school setting. Some staff members also noted that while they have not personally completed formal Lámh training, they have acquired some signs from colleagues. However, they felt this may increase the rate of inaccuracies in production of sign, highlighting the importance for further training opportunities to reduce the incidence of communication breakdown (Byrne et al., 2019).

1.6.1 Parents, peers and staffs use of Lámh

To effectively implement KWS, communication partners need to be involved. Carroll et al. (2021) conducted a case series to explore the experiences of three children and their communication partner's use of KWS. The first two cases were two children with Down syndrome both attending special school. The third case was a nine year old girl with Down syndrome who was a Lámh user attending a mainstream school. All children used Lámh to communicate and their communication partners includes their parents, teacher, special needs assistants (SNAs) and also one SLT. A series of observations in both the home and school environment, and semi-structured interviews with the children and their communication partners took place. Following thematic analysis, three themes were identified. The first theme related to what makes Lámh work, where willingness to use Lámh and consistency in such use

were discussed. Participants felt that in order for communication to be successful, the communication partner needed to be willing to embrace alternative communication. Teachers also made reference to the difficulties encountered when a substitute teacher has no Lámh knowledge, leading to communication barriers. One parent also highlighted that extended family did not use KWS as they had insufficient exposure. The next theme related to how KWS supports the children to be understood and how being misunderstood can cause high levels of frustration. One parent discussed the difficulty for her child when communicating with peers in extracurricular activities as the peers had no knowledge or awareness of KWS. The final theme referred to the longing for more support. Participants felt that KWS systems such as Lámh required further attention to build awareness, increase the provision of resources and promote generalisation (Carroll et al., 2021).

Research highlights parent's views of using Lámh as a KWS system with children. Glacken et al. (2019) completed a series of interviews with parents of children with ID to examine their experiences with Lámh. While the sample size was small (n=18), the study provided invaluable insight into the impact Lámh has on families in the Irish context. All participants in the study had completed Lámh training, and overall, there was a positive attitude towards Lámh. Parents highlighted the benefits of having an easily accessible form of AAC, with no reliance on supporting materials or devices to communicate with their children. An important factor raised was the reduced levels of frustration and distress for children as use of Lámh signs assisted parents to discern their child's needs and desires (Glacken et al., 2019). Some parents also described the limited support from educational settings in terms of implementing Lámh, primarily in the mainstream context.

Teachers and SNAs are key communication partners within the school environment. O'Leary et al. (under review) examined the perceptions and experiences of Lámh use in the first year of mainstream primary school for children with Down syndrome. Five teachers and

eight SNAs who worked across 5 primary schools where a child with Down syndrome attended were involved in this study. The staff were taught 25 signs at four time points throughout the year. Their perceptions and experiences were explored by conducting semi-structured interviews at four time points during the year: beginning of term 1, midpoint of term 1, beginning of term 2 and beginning of term 3. The authors of this study noted that due to circumstances outside of their control, not all participants completed the four interviews. This resulted in a total of 19 teacher interviews and 20 SNA interviews. The data collected was subsequently analysed using inductive content analysis where four main themes emerged, 1) challenges, 2) facilitators, 3) benefits and 4) incorporation into the whole school environment. In terms of challenges, teachers noted that there was a notable absence of any pedagogical framework to teach Lámh which served as one of the subthemes. Teachers felt that the Module One course insufficiently prepared them to go about teaching Lámh and implementing it in the classroom environment. Furthermore, specific Lámh signs pertinent to the school setting were not available within the Module One course which was an additional challenge expressed by teachers. Another subtheme within challenges was limited access to training, expressed by SNAs. The implications of this were outlined by SNAs whereby challenges of creating a Lámh signing environment were noted. In addition, SNAs worried about their signing accuracy and demonstrated some reservations about the impact of such confusion. This can be related to their capability, the reduced knowledge of signs could be contributing to the use of sign in school. Both teachers and SNAs noted the challenge of remembering to use signs, and doing so correctly and consistently. The demands of incorporating Lámh into the school curriculum were noted which could be attributed to both a lack of time but also need for integration to become a habit. Finally within this subtheme, issues with manual dexterity were also mentioned by teachers. Manual dexterity related more to the Lámh users than the teachers themselves, but nevertheless was mentioned as a challenge of Lámh use in the classroom. To mention briefly,

the second theme outlined was facilitators. These included the support from an SLT, the availability of resources such as DVDs or the Lámh website, and embedding signs into routines. Teachers and SNAs both echoed these facilitators and the positive role they played on their experiences of Lámh to date. The third theme was concerned with the benefits of using Lámh, including promotion of inclusivity, reducing learner frustration and enhanced language comprehension and expression. Finally, the fourth and final theme related to incorporating Lámh into the whole school environment. Staff shared examples of Lámh use across different contexts in the school environment. This theme also noted the support from others which can be considered as social opportunity as per the COM-B model. Seeing other colleagues value Lámh and take an interest in signing was noted by SNAs. Peers were also seen to use signs and the use of Lámh was generalised regardless of having the child with Down syndrome present or not. Overall, teachers and SNAs demonstrated changes in their perception of Lámh use over the course of the academic year. While it was initially a stressful process for some, the use of Lámh was seen as a positive addition overall for staff. Increased motivation was also evident over time highlighting the potential for positive behaviour change when Lámh is consistently implemented over a period of time.

Moreover, the use of KWS by peers of children with Down syndrome has been investigated in recent years. Bowles and Frizelle (2016) investigated the attitudes of peers towards the use of KWS by children with Down syndrome in mainstream schools by employing an interpretative phenomenological analysis of interview data. Eight participants from two schools ranged in ages from 6 to 8 years of age. All participants were peers of a child with Down syndrome in their class. They demonstrated a good understanding of Lámh and the benefits of using signs in the classroom for a Lámh user as per their comments in the interviews. As all children in the class were learning Lámh, there was no reports of stigmatisation of the child with Down syndrome for using Lámh. The children reported that while they all knew

how to use Lámh, they don't need it to support their communication as much as other students i.e. the primary Lámh user in the class. While the children did not need it themselves, the participants still had a positive opinion on the use of Lámh in a mainstream school. Notably, the children also felt that the signs can be difficult to remember, which outlines the importance of teachers to adopt a consistent and structured approach when teaching and modelling signs, but also to support the use of sign in unstructured activities such as yard time or lunch time (Bowles & Frizelle, 2016). The authors also note that although speculative, one potential reason for children's difficulty to remember signs could be the limited time spent learning and practising signs (Bowles & Frizelle, 2016). As previously outlined, there is no specific training or guidelines in relation to implementing Lámh in schools. It is important that teachers are supported by an SLT or Lámh tutor, until access to formal courses which include more school based vocabulary can be provided.

1.7 Inclusive Education

Children with communication difficulties are at risk for reduced levels of participation in classroom activities and consequently, greater risk of exclusion (Aldabas, 2021). Aldabas (2021) note that communication is the medium through which children learn but also the medium used for teachers to give instruction, generate meaning and demonstrate the skills their students are expected to acquire. For inclusive education to be effective for all children, supports should be put in place to eliminate barriers to communication (Radici et al., 2019). KWS is one such low tech AAC support to be used as it allows children with communication difficulties to engage with staff and peers and access the curriculum in a way more meaningful to them. The culture of KWS use in mainstream primary schools requires investigation to fully understand what changes are needed in order for KWS to be fully immersed in the educational setting.

1.7.1 Inclusive education in Ireland

As is the case worldwide, the provision of special education has been subjected to considerable change over the past few years and facilitated the shift towards inclusive education in Ireland (Rose et al., 2010). Inclusion outlines the commitment to each individual child's education, in the school or classroom they attend regardless of the extent of their disability (Meegan & MacPhail, 2006). An inclusive school can be defined as 'a place where everyone belongs, is accepted and is supported by his/her peers and other members of the school community in the course of having his/her educational needs met' (Stainback & Stainback, 1990, p.3).

In Ireland, the Equal Status Acts 2000 (Oireachtas, 2000) state that schools must reasonably accommodate children with disabilities. Furthermore, the Education of Persons with Special Educational Needs (EPSEN) Act 2004 (Oireachtas, 2004) stipulates that a child with SEN 'shall be educated in an environment with children who do not have such needs'. This provides all children with the right to access mainstream education. However, exclusions do apply to such acts in certain circumstances, where it is believed not to be the best interests of the child or fellow pupils. The National Council for Special Education (NCSE) outlined the aims of inclusive education to 1) support reflection on a school and individual level for the development of inclusion, 2) support implementation of inclusive practices and policies, 3) demonstrate organisational planning processes to facilitate such implementation, 4) record school's practices and note constraints and resources related to inclusion and 5) encourage commitment to such inclusive practices and policies (NCSE, 2011).

In 2018, Ireland ratified the UN Convention on the Rights of Persons with Disabilities (CRPD), to implement inclusive education across all levels for people with disabilities nationwide (Murphy et al., 2022). The ultimate goal of such inclusive education system is to enable people with disabilities to effectively partake in education. Educational institutions must

provide accessible education and individualised support to adapt to the needs of people with disabilities. Moreover, the UNCRPD Committee clarified that inclusive education 'involves a process of systemic reform embodying changes and modifications in content, teaching methods, approaches, structures and strategies in education to overcome barriers with a vision serving to provide all students of the relevant age range with an equitable and participatory learning experience and the environment that best corresponds to their requirements and preferences.' (CRPD Committee, 2016, para. 11). The CRPD Committee also provides insight into the importance of staff training in order for inclusive education to be implemented effectively 'all teachers and other staff receive the education and training they need to give them the core values and competencies to accommodate inclusive learning environments, which include teachers with disabilities' (CRPD Committee, 2016, para. 11). Notably, while these provisions remain in place, Ireland cannot fully implement the inclusive education model of the CRPD, partly due to the associated costs and current economic situation (Murphy et al., 2022).

In current Irish practice, children with SEN avail of education in different settings: 1) mainstream school, 2) special school and 3) special class within mainstream school (Rose & Shevlin, 2020). McConkey et al. (2016) analysed a national database regarding children receiving services from intellectual disability services in Ireland. Over the course of 10 years (2003 to 2013), there was an increase in the number children with ID attending mainstream classes from 16.6% to 25.5%, and a decrease in those attending special schools from 72% to 63%. In addition, the number of children with ID attending special classes within mainstream schools decreased, but not to the same extent as special schools (McConkey et al., 2016). Similarly, the number of children with ASD attending mainstream education has increased in the last decade, with 63% of children now accessing education in a mainstream environment (Leonard & Smyth, 2022). This shift to more inclusive education has raised questions regarding

the supports and training put in place for teachers. Are the supports and trainings comparable to that required based on the change in legislation? This is a crucial aspect for the successful implementation of government policies relating to inclusive education.

1.7.2 Attitudes towards inclusive education in Ireland

Teachers play a vital role in the success of inclusive education. Leonard and Smyth (2022) completed a study where 78 primary school teachers employed in ASD units in mainstream schools in the Republic of Ireland were surveyed to establish their views on the inclusion of children with ASD in mainstream education. The items on the survey were either positively or negative phrased. Only 10% of participants had a positive attitude towards inclusion of children with ASD in mainstream settings, whereas 54% had a negative attitude towards inclusive education (Leonard & Smyth, 2022). Participants were also asked about resources to facilitate inclusion and the impact of this. Sixty six percent of participants did not feel they had adequate resources compared to 34% that felt they did so. When asked what resources would support inclusion, 74% noted human resources and 55% outlined classroom materials as necessary resources to adequately support children with ASD in their classroom, representing both social and physical opportunity as per the COM-B model (Leonard & Smyth, 2022). Interestingly, there was clear statistical significance in the relationship between responses related to attitudes and resources when a t-test was applied. Participants who demonstrated more positive attitudes towards inclusion felt that they had the adequate resources compared to those who felt they lacked resources, sharing more negative attitudes (Leonard & Smyth, 2022). This should perhaps be interpreted with caution as the sample size of 78 participants is not representative of the full population. This research highlights the importance of ensuring provision of training to support children with ASD in the classroom. This may include upskilling in use of low-tech or high-tech AAC and communication systems

such as KWS. To consider this in terms of the COM-B model, increased levels of capability and opportunity have the potential to impact behaviour (Michie et al., 2014).

Studies have also looked at the views of teachers in Ireland toward inclusion at second level. For example, O'Toole and Burke (2013) completed a study investigating the attitudes and concerns regarding inclusion amongst a cohort of Irish secondary student teachers. One hundred and ten student teachers participated in this study, all of whom were enrolled in a SEN module as part of their training. Part one of the survey focused on demographic information. In part two, participants were presented with a series of statements such as 'the staff at my school are highly supportive of me', where they had to indicate their level of agreement on a five-point Likert scale. Part three of the survey was based on an adapted version of the attitudes toward inclusive education scale (ATIES) developed by Wilczenki (1992). Part four of the survey was predicated on the inclusive education scales (CEIS) by Sharma & Desai (2002), consisting of 21 items. Both items in part three and four were related to teachers concerns regarding inclusion in mainstream education settings. Finally, part five was in conjunction with the TE Scale (Woolfolk & Dembo, 1984) with 22 statements relating to teachers personal beliefs about their ability to provoke positive educational outcomes for students. To summarise the results of this survey, the hierarchy of scores in the ATIES indicated teachers had positive attitudes towards inclusion, specifically the participants had more positive attitudes towards including students with speech and language difficulties compared to those with sensory of learning difficulties. (O'Toole & Burke, 2013). In terms of the CIES scores, the most prominent area of concerns included a lack of resources and supports available to teachers to support students with additional needs, which can be mapped to both physical and social opportunity. The positive attitudes towards inclusion of those students with speech and language difficulties indicates that the future generation of teachers are open to inclusion of children with additional needs, but worry about the lack of resources and training available to support such students.

This reiterates the importance of providing teachers and staff with appropriate training and access to ongoing support to fully support children with speech and language difficulties, especially those that may use alternative communication in the classroom.

The attitudes to inclusive education in relation to Irish legislation and policy has been documented in research by many authors, including Shevlin et al. (2013). Twenty-four interviews were conducted with seven school principals, nine class teachers and eight support staff (resource) from seven different primary schools. This study involved both primary and secondary schools in different locations, including urban, rural and provincial. The areas explored in the semi-structured interviews included understanding of inclusion, whole school policies and approaches in relation to inclusion, examining current inclusive/exclusive practice, beliefs about inclusion, current skills and confidence levels, support systems established, curricular access for pupils and learning outcomes. Two key themes surfaced following thematic analysis of the data. The first theme was the perceptions of inclusive education which includes the meaning of inclusion, how to enable inclusion, variations in the school ethos and concerns about inclusion. Participants viewed inclusion as a challenge but an area for further professional development. This is important to note in terms of areas such as communication. Staff require training in these areas to support children with additional needs and facilitate inclusion appropriately. School ethos was another subtheme, where staff noted the impact that leadership had on the success of inclusion. A child needs to feel they belong, feel welcome and accepting their different methods of communication could be a key component here. The second major theme in this study was the perceived constraints on inclusive practice. Participants noted inadequacies in training as a barrier to creating inclusive educational environments. This could be viewed in relation to the COM-B model, where capability is a key component. Time was also cited as a barrier, which is reflected as a component of physical opportunity within the COM-B model. Participants felt they had limited time to deliver the

curriculum and devise appropriate interventions for each individual student while also developing inclusive practice. Similarly, participants felt that access to greater support could be a facilitator to create more inclusive classrooms, again relating to the COM-B model, this time physical opportunity. This once again highlights the importance of increased proficiency in areas of AAC such as KWS, to ensure children feel that their methods of communicating and interacting are valued and understood. To generalise these findings more closely to the population of Ireland, a much larger sample size would be beneficial. Nonetheless, the broad range of locations (i.e. urban vs rural) and setting (primary vs post primary) served as a good starting point for an investigation of this kind.

1.7.3 Inclusive education worldwide

The Salamanca Statement sought inclusion to be the new norm and provided a framework called the 'Salamanca Framework' to guide schools to accommodate children with additional needs (UNESCO, 1994). The Salamanca Framework works on the assumption that regardless of a child's individual needs, the design of the education system must accommodate each child as all children can learn. An important aspect of the Salamanca Framework is establishing and maintaining a collaborative school culture. Class teachers, peers and parents all play a role in this process which highlights the need for the use of KWS in schools to facilitate communication and promote inclusivity. An exemplary model of inclusive education for all students can be seen in the Canadian province of New Brunswick, where children with disabilities attend mainstream schools and receive individualised support, regardless of the level of support needed (AuCoin et al., 2020). The model of inclusion in New Brunswick was driven by the Salamanca Framework. This is further stipulated by the Canadian Bill 85 (Porter, 1995) which is a mandate for the public education system to educate all children, including students with disabilities or special needs. This shift in legislation was seen to act as a catalyst for social justice and equity by adopting a systemic approach to inclusive education for children

with disabilities. Aucoin et al. (2020) analysis of New Brunswick's approach to inclusive education notes that stakeholders and partners within a community must be engaged as one in order for inclusive education to be successful.

1.7.4 Stakeholders in inclusive education

Stakeholder collaboration is an essential part of successful inclusive education. The principal, class teacher, resource teacher and learning support teacher all play a vital role in supporting a child with SEN. However, an integral part of supporting such inclusive education is the assistance provided to students with SEN by non-teaching staff. Internationally, these staff members have been assigned different names, including Special Needs Assistants (SNAs) in Ireland, Teacher Assistant (Canada), Teacher Aide (Australia and New Zealand), Teaching Assistant (UK) or Integration Helpers (Germany) (Ryan Sheehan, 2023). Notably, this role can vary depending on the country for example in the UK, Teaching Assistants often support the teacher to fulfil academic tasks under direct supervision, with children who have specifically outlined needs, (Boundy et al., 2023). SNAs were first introduced to classroom in Ireland in 1993. In 2023, there were 19,480 SNAs employed in Ireland (Ryan Sheehan, 2023). As per the NCSE (2017) "the SNA scheme is designed to provide schools with additional adult support that can assist students with special educational needs who also have additional and significant care needs. Such support is provided in order to facilitate the attendance of those students at school and also to minimise disruption to class or teaching time for the students concerned, or for their peers, and with a view to developing their independent living skills" (NCSE, 2017, pp.7). The SNA scheme plays a role in the successful inclusion of children with SEN as they can support the additional care needs of children in the school setting (Murphy et al., 2022). The care role of an SNA is important and non-teaching in nature. However, some SNAs have adopted an educational support role when working with children with SEN in mainstream schools due to the busy nature of the classroom and high student to staff ratio (Keating &

O'Connor, 2012). This educational support typically comes in the form of clarifying teacher instructions, interpreting lessons and assisting students with educational activities such as reading, writing or maths (Logan, 2006). Some class teachers do assign education responsibilities to the SNA allocated to a child in their classroom. This can raise questions regarding their role and training to fulfil different duties (Keating & O'Connor, 2012). Whether it is care needs or educational support, SNAs need to be capable to proficiently communicate with the child they support. This too can be applied for the social integration aspects of the school day. The SNA has some role in supporting the child they work with the engage with peers both inside the classroom and in the yard for example.

Teachers, SNAs, parents and allied healthcare professionals such as speech and language therapists or occupational therapists need to communicate and collaborate to promote educational engagement and achievement for children with communication difficulties/ ID. Vlcek et al. (2020) investigated the collaborative experiences between the stakeholders listed above to support children with ASD in mainstream school in Australia. One hundred and twenty nine people participated in the online survey. This included 41 teachers, 44 parents and 44 allied health professionals. Numerous themes were devised, including the objectives of collaboration and the consequential positive outcomes and benefits for children with ASD. Participants outlined working within a team (92.5%) and attaining positive outcomes (62.79%) as the most common objectives of collaboration. Participants in all three groups outlined benefits of collaboration to include combined support for shared goals (31%), individual skill development (29.46%) and consistency across environments (20.16%). The participants also outlined the barriers to collaboration and the possible areas requiring attention to improve this process (Vlcek et al., 2020). Time and financial constraints (46.51%) and inadequate support from co-collaborators (24.03%) were the greatest barriers outlined by participants. The two key themes that were derived from what areas could improve this process included procedural

and policy adjustments (16.28%) and increased opportunities and frequency of collaboration (44.19%) (Vlcek et al., 2020). The outcomes here highlight the importance of social opportunity, which is a component of the COM-B model.

To encapsulate the content of this first chapter, it is important to reflect on the principles of KWS, an unaided form of AAC which is used to support communication across the lifespan. While KWS has numerous benefits including improved language comprehension and expression, it is important to draw attention to the vital role communication partners play in the use of KWS. Inclusive education is a policy priority in Ireland at this time and the utilisation and acceptance of alternative methods of communication is central to successful implementation. To become proficient in the use of KWS in mainstream education in Ireland, it is necessary for teachers and SNAs to have the knowledge required. This may be attained through the provision of training or from experience. Staff require both social and physical opportunity such as support, time and materials. Finally, attitudes towards KWS and indeed inclusive education may contribute to the intrinsic and extrinsic factors concerned with motivation. To facilitate behaviour change, the COM-B model is often applied in research. This will be discussed in further detail in the following chapter.

Chapter 2 Behaviour Change & the COM-B Model

The gap that may exist between research and practice has been widely discussed. The term ‘implementation science’ refers to the investigations which seek to probe scientific enquiry into methods and strategies that could facilitate uptake of evidence-based interventions (Peters et al., 2013). The identification and understanding of contextual barriers and facilitators in addition to the development and testing of strategies are key components of implementation research within clinical and community settings (Shelton et al., 2020). Improving the implementation of evidence practice is dependent on behaviour change in practice (Michie et al., 2011). To facilitate improved translation of research into practice, behaviour needs to be analysed.

In 2022, Douglas et al. conducted a scoping review of implementation science research in communication sciences and disorders. To identify relevant studies for inclusion, a search query of electronic databases was completed whereby studies were screened by title and abstract, followed by a full-text review. In addition, further identification of studies occurred via forward and backward citation searches on research in the full-text review outlined above. While one thousand two hundred and forty nine studies were gathered in the database search, only one hundred and nineteen underwent the full text review. This resulted in exclusion of thirty six studies so eighty two studies remained and were thus included in the scoping review (Douglas et al., 2022). The most prominent patient population featured in these studies was aphasia (21.3%), followed by dysphagia and hearing related issues with 13.1% each respectively. Only sixteen and a half percent related to language disorders in children while 11.5% related to the autistic population. Douglas et al. (2022) reported that only eight percent of implementation science based studies related to SLCN interventions in the educational setting. This is important in terms of the populations in this current study, as it highlights the

paucity of research in this area. Interestingly, over 40% of the reviewed studies evaluated the effects of education or training as an implementation strategy, instead of using an implementation framework to direct the study. Although education and training between the client and the provider are necessary for the majority of interventions related to communication sciences and disorders, the authors also point out that these measures can be used as a strategy to support the uptake of the intervention. It is important to acknowledge the current research available in relation to implementation science and communication disorders, and the findings by Douglas et al. (2022) highlight that future research in this area should consider adopting a framework of implementation to overcome obstacles at organizational level in practise and trigger effective behaviour change.

Gallagher et al. (2023) completed a scoping review also, where the focus was on research relating to implementation science in school-based universal-level intervention. Database searches resulted in four thousand eight hundred and eight four articles for title and abstract screening, with ninety eight articles screened at full text stage. This yielded twenty two articles for inclusion in the scoping review. Papers originated from the United States, Australia, United Kingdom and Norway primarily. While 5 studies addressed communication and interaction intervention for autistic children, most studies (n=13) related to social, emotional and mental health (Gallagher et al., 2023). Content analysis was undertaken where taxonomy proposed by Nilsen (2015) and the domains of the Consolidated Framework for Implementation Research (CFIR) was used. Knowledge and beliefs was frequently coded as highly influential on the process of implementation. Similarly, constructs relating to readiness for implementation were prominent. This included leadership, resource availability and access to knowledge/information. To triangulate findings from the identified literature with the views of practitioners, Gallagher et al. (2023) completed further research by conducting interviews. This was purposive in nature as teachers and SLTs were sought to partake and complete an

online questionnaire. This questionnaire was comprised of statements regarding the influence of CFIR constructs on the implementation of new interventions in schools that required rating using a 5 point Likert scale. Practitioner confidence and adaptability of intervention were agreed by 90% of participants as influential. A further 80% to 90% agreed that leadership and school culture, knowledge and beliefs and intervention complexity played an influential role. Approximately only 50% of participants agreed that evidence base behind intervention would be influential. While these factors were related to constructs of the CFIR, the findings could be translated to the COM-B model, for example knowledge within the psychological capability construct, or school culture within the social opportunity construct. While this scoping review by Gallagher et al. (2023) relates to universal level intervention in school, targeted or specific intervention will require similar constructs for implementation to be successful and trigger effective behaviour change. This chapter will explore behaviour change, with a specific focus on the COM-B model (Capability, Opportunity, Motivation and Behaviour) and how this can be applied to educational research and practice.

2.1 Behaviour Change

The basis of behaviour change is to alter habits and behaviours for a long term impact. Numerous theories, models and frameworks exist regarding behaviour and behaviour change. This section will outline the most frequently used theories and models. The **theory of reasoned action** was developed by Fishbein and Ajzen (1975) which posits that behaviour occurs as a result of intention. In this case, intention is impacted by personal attitude and social norms perceived. The theory of reasoned action outlined that a more positive attitude and implementation of the desired behaviour by others, leads to a stronger intention to change behaviours. This theory was extended in the 1980s by Ajzen to include perceived behavioural control as an influencing factor on intention, becoming the **theory of planned behaviour** (Ajzen, 1985). This behavioural control relates to the persons own confidence in their level of

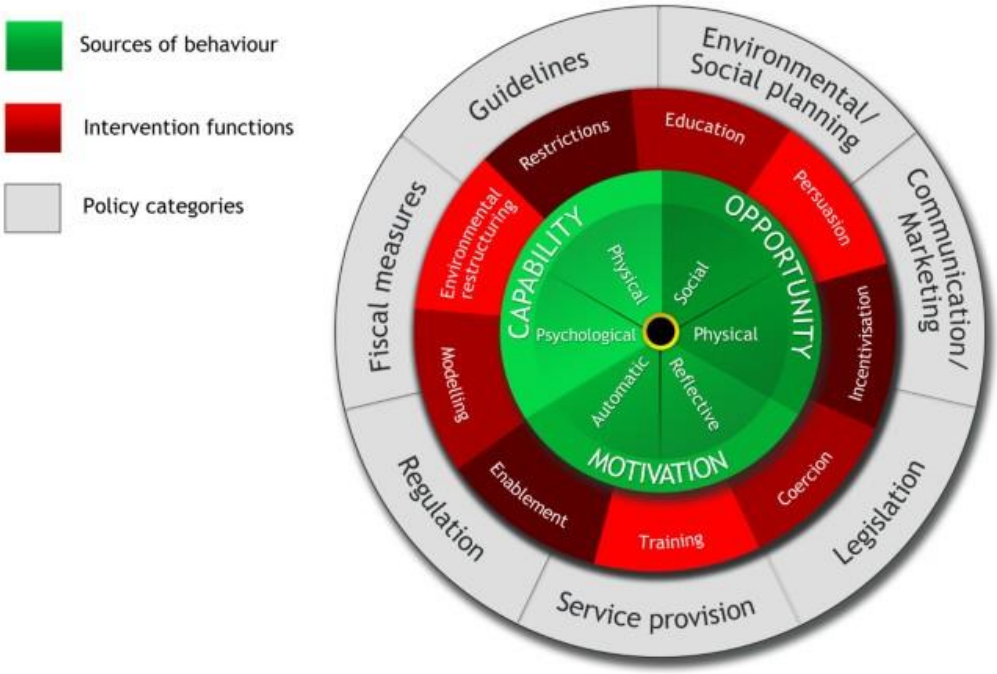
capability to perform the target behaviour and address barriers or challenges encountered in the process.

Furthermore, the **social cognitive theory** was proposed in 1986 by Bandura whereby it is outlined that behaviours are often learned through observation of others within our social environment. The target behaviour needs to be modelled for us to remember and reproduce such behaviour. Again, this theory was expanded to become the social cognitive model, which now included personal factors of cognition, affect and biology. Within these factors, personal resources, ability, self-efficacy and expectations are considered, in addition to barriers and facilitators that may be encountered. Bandura highlighted that people are their own agents of development or change, and the factors mentioned above are influential in the selection of our actions.

The **trans theoretical model** was developed by Prochaska and DiClemente in 1983 and outlines 6 potential stages of behaviour change. Stage one is precontemplation**,** where the individual is not intending to change their behaviour. This may not be fully informed about the consequences of their behaviour or not have the confidence due to previous failed attempts. Stage two is contemplation, where an individual considers changing their behaviour within the next 6 months. In this stage, people can see the potential advantages of change but have an awareness of challenges they may face. Preparation is stage three, where an individual is preparing of behaviour change within the next month and have taken some steps such as seeking support to begin implementing this change. Stage four is action**,** significant changes to behaviour leading to different outcomes have been made in the past 6 months. Maintenance is the penultimate stage as behaviour change is still ongoing but not to the same extent, usually just enough to prevent the occurrence of relapse. Stage six is termination**,** where an individual feels confident that the changes made are sufficient to last long term.

Figure 1

Behaviour Change Wheel (Michie et al. 2011)



Furthermore, Michie et al. (2011) designed the **behaviour change wheel** to create a framework whereby behaviour change interventions could be analysed. The behaviour change wheel was developed as a result of synthesising nineteen frameworks of behaviour change, one of which is the COM-B model (Michie et al. 2011). The wheel is composed of three layers; 1) the hub which is the centre of the wheel outlines sources of behaviour based on that of the COM-B model, which could be intervention targets, 2) the middle layer is comprised of nine intervention functions, based on the specific COM-B analysis and 3) the outer layer outlines seven policy types that can be used to deliver intervention functions (see Figure 1) (Michie et al. 2014).The behaviour change wheel involves three key levels. Level one aims to define the 'problem' in behavioural terms and identification of the target behaviour needed for change. Level two aims to explore the factors impacting one's behaviour, using the COM-B model.

The third and final level aims to identify the functions of intervention to contribute to the development of a user acceptable intervention which will achieve the aims outlined for such intervention (Michie et al., 2014). Behaviour change is a central aspect to improvements in healthcare and patient outcomes or education and academic outcomes for example. Behaviours could relate to numerous stakeholders. This could include students, for example engagement with the curriculum, patients, for example medication adherence, healthcare staff, for example implementation of evidence based best practice or that of the general population, for example cessation of smoking (Cane et al., 2012). It can be a challenging task to alter behaviours, which highlights the importance of designing interventions based on evidence-based principles (Cane et al., 2012). As mentioned above, the COM-B model forms the centre of the behaviour change wheel and will be discussed I further detail in the following section.

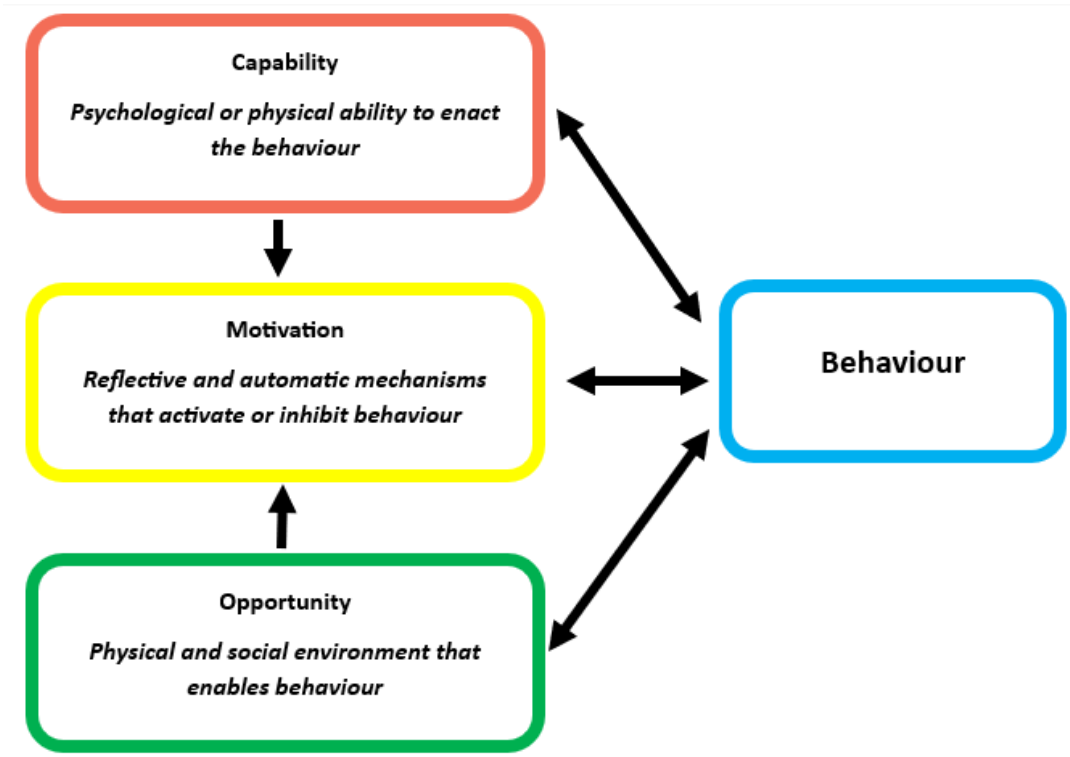
2.2 COM-B Model

The **COM-B model** was designed by Michie et al. (2011), to represent a behaviour system where capability, opportunity and motivation interact to generate behaviour. The origins of the COM-B model stem from different health behaviour models such as the theory of planned behaviour (Armitage & Conner, 2001), health belief model (Harrison et al., 1992), social cognitive theory (Young et al., 2014) and the self-determination theory (Plotnikoff et al., 2013) (Michie et al., 2011). Different constructs within these pre-existing models and theories were analysed as per the design of the behaviour change wheel, and the key constructs extracted for inclusion in the COM-B model. The COM-B model is widely used to guide data collection and analysis in qualitative research, inform development of interventions and explaining systematic review findings (Keyworth et al., 2020). It can also be used to examine existing behaviour where analysis can provide insight into what is required to facilitate behaviour change. There are three key components within the COM-B model: 1) capability, 2) opportunity and 3) motivation. Each of these components represent the conditions required for

behaviour to occur. In the context of this study which examines teachers and SNAs use of Lámh, examples for each component are outlined in Figure 3.

Figure 2

Components of the COM-B model (Michie et al., 2014)



2.2.1 Capability

Capability is divided into two main subcomponents, **psychological capability and physical capability** (Michie et al., 2011). **Psychological capability** refers to an individual's levels of knowledge relating to a particular task and confidence to carry out such task. In this instance, teachers and SNAs would need to have good knowledge of a variety of aspects related to Lámh in order to use it. This includes knowledge about the importance and benefits of using Lámh, knowledge of how to integrate Lámh into school activities and knowledge of the range of Lámh signs available. Knowledge also extends to insight of where to access resources or Lámh signs. If a staff member does not have this knowledge, they will not be able to improve their capability to use Lámh in school. Staff also require the knowledge of how to encourage a

Lámh user or their peers to use signs in school. To be fully capable to use Lámh in school, teachers and SNAs also need a supportive environment and have the mental stamina to continue signing throughout the school day. The second subcomponent related to capability is **physical capability**. In order to use Lámh in the school environment, staff would need the physical skills to make signs. They would also need to physically know how to do the steps and hand shapes for different signs and require the physical stamina and strength to use Lámh throughout the school day.

2.2.2 Opportunity

Opportunity relates to factors that lie outside of an individual (Michie et al., 2011). The two subcomponents of opportunity include **social opportunity** and **physical opportunity**. **Social opportunity** includes the support from other people in school to use Lámh, or the actual use of Lámh by other people (i.e., people using signs and engaging with Lámh users). **Physical opportunity** includes environmental opportunities than would impact use of Lámh. This includes time, as staff need time to plan Lámh use and time to integrate Lámh into the classroom activities. Staff would also need access to the materials necessary to support teaching Lámh and using Lámh. This varies from resources previously mentioned. Resources are viewed in terms of the capability to know what resources are available and where one might find them. Materials however refers to the opportunity of needing access to the necessary materials. One might know what these are but does not have access for example. Triggers and reminders that could prompt the use of Lámh are also considered physical opportunities. Finally, the ability to earn more money as a result of using Lámh could also impact sign use, making financial gain another physical opportunity (Michie et al., 2011).

2.2.3 Motivation

Motivation is the process that promotes and directs one's behaviour. This is the third component within the COM-B model and subcomponents include **reflexive motivation** and **automatic motivation** (Michie et al., 2011). **Reflexive motivation** is related to the process of

reflecting on self-conscious intentions, plans and evaluations. Staff would be motivated by developing better plans for using Lámh and develop a habit of using signs. **Automatic motivation** involves the emotional reactions, desires, impulses and inhibitions to use Lámh. Teachers and SNAs would need to feel that they want to use Lámh and get a sense of satisfaction from using signs. They would also need to feel the need to sign and care about the potential negative consequences of not doing it. Staff would also need to believe that using Lámh is a good thing do it and have a sense of motivation by this (Michie et al., 2011).

Figure 3

COM-B Model Components

Component	Subcomponent	Description
Capability	Psychological Capability	Knowledge
		Psychological skills, strength or stamina
	Physical Capability	Physical skill, strength or stamina
Opportunity	Social Opportunity	Opportunities influenced by social cues, interpersonal interactions, workplace support or cultural norms
	Physical Opportunity	Environmental opportunities relating to time, resources, locations and prompts
Motivation	Reflexive Motivation	Process of reflecting on self-conscious intentions, plans and evaluations
	Automatic Motivation	Processes that are automatic involving emotional reactions, desires, impulses and inhibitions

2.2.3 Application of the COM-B model in research

The COM-B model has been used in previous studies in a variety of different ways. This includes both behavioural analysis and intervention design. In the case of the current study, the COM-B model was used to examine behaviour which is a pre-cursor to designing an intervention. The distinction between these two processes was outlined by Law et al. (2021), who described the difference between the 'bottom up' and 'top down' approaches. The term 'bottom up' refers to using the COM-B model to support design of an intervention where the focus is behaviour change. On the contrary, in the 'top down' process the COM-B model is applied to critically analyse key elements of an intervention and reflect on the findings to understand behaviour in the occurring context (Law et al., 2021; Michie et al., 2014). In the current study, the 'top down' process was applied to examine teachers and SNAs use of Lámh in the mainstream school environment. Specifically, the COM-B model was used to design the questionnaire and focus group questions to elicit the necessary information from participants in this study.

Research relating to speech and language therapy includes limited examples of the application of the COM-B model. Stringer et al. (2023) applied the COM-B model to identify what change is required for Early Childhood Educators (ECEs) and SLTs to engage in partnership. This study was completed as part of the Northumbria Healthcare-Newcastle Universal, Targeted and Specialist project (NNUTS). NNUTS aims to develop an intervention facilitating effective and sustained partnership between SLT services and educational settings to improve oral language skills, school readiness and engagement with literacy and formal education for preschool children. Stringer et al. (2023) outline the use of the BCW, specifically stage one to understand the behaviour, in this case engagement between ECEs and SLTs. Thirty ECEs and eighty three SLTs all of whom worked in areas of social deprivation in England completed a questionnaire. The information elicited in this questionnaire was then transferred

to the COM-B model, which is the hub of the BCW, to determine what change is needed. Within capability, opportunity and motivation both barriers and enablers were identified. ECEs felt they had poor knowledge of specialist resources and a lack of confidence in their own levels of capability (capability barrier) while they felt they understood the need for partnership and would be able to build on their existing levels of knowledge (capability enabler). SLTs on the other hand felt they had poor knowledge of the curriculum and protocols within educational settings (capability barrier). SLTs noted they had social capital skills, they felt capable of training others and engaging in reflective practice (capability enabler). In relation to opportunity, ECE staff felt they had inadequate time to engage in planning or meetings with the SLT and poor access to intervention resources or the necessary budget for training (opportunity barrier). The ECE staff did mention having protected time for the SLCN intervention and good management-led systems for supervision and support (opportunity enabler). SLTs shared similar concerns regarding lack of time for meetings and planning (opportunity barrier) but they too felt they had team support and protected time for engaging in continual professional development (opportunity enabler). Finally, the ECE staff felt that the opportunity barriers they faced negatively impacted moral (motivation barrier) while the SLTs noted no motivational barriers. ECE staff and SLTs both highlighted the perceived benefit to the children (motivation enabler) and SLTs felt motivated by the increased efficiency and improved relationships they may have (motivation enabler). This study by Stringer et al. (2023) postulates the positive impact application of the COM-B model serves on SLT specific research, particularly in this instance when related to education as is the case in the current study. This reminds us of the importance of a coherent investigation in stage one of the behaviour change wheel to understand the target behaviour before intervention design and implementation can be considered. This study is similar to the current study, as the use of Lámh

by teachers and SNAs is investigated so we can fully understand what is needed to prompt behaviour change.

The COM-B model can also be used to describe experiences outlined by participants in research. This is evident in a study by Rombouts et al. (2017) where the experiences of staff using KWS in special schools and residential homes was investigated. Five special secondary school teachers were recruited for this study. Each of these teachers had between six and fourteen years' experience working with students with intellectual disability. In this particular study, staff from residential homes were not recruited, instead five interview transcripts from a previous study by the same authors. These five staff members had between two and a half and thirty six years of experience supporting people with intellectual disability. For the transcripts of the residential home staff members, the statements that most explicitly referred to KWS were extracted. The teachers were asked the same interview questions with one adaptation made, the questions focused on KWS only and not AAC overall as was the case in the previous study. The interviews were audio recorded and transcribed verbatim, with thematic analysis then taking place. The key themes that emerged included 1) use of KWS, 2) consistent use of KWS is motivated by perceived benefits and 3) KWS implementation is habit formation. It is important to note that in the case of this study by Rombouts et al. (2017), the COM-B model was noted used to construct the questions in the semi-structured interview. However, the authors note that based on the themes outlined, the participants experience of KWS could be described by utilising the COM-B model as a framework. An example of this discussion included motivation serving as a driving force for KWS use when staff could anticipate and observe the positive effects, for example KWS improving receptive and expressive language skills. In addition, a lack of confidence in their own ability led to decreased sign use. This study adds to the realm of literature in relation to KWS and attempts to map the findings onto the COM-B model. To improve the methodological design of this study, perhaps

the COM-B model could have been applied from the very beginning and included in the process of interview question design. As the study relied on previous data there was a lack of flexibility to do so.

2.2.4 Application of the COM-B model in questionnaire design to examine behaviour

The use of the COM-B model in methodological design to examine behaviour is evident in recent research and the research design of some existing studies is comparable to the design of the current study. The following studies include different areas of research but all present with similar methodological research design but using questionnaires based on the application of the COM-B model which is relevant in the current study. Bennett et al. (2021) completed a cross-sectional study to explore clinician's experience of auditory rehabilitation. The participants in this study were sixty two healthcare clinicians working in an auditory rehabilitation setting in Australia. The COM-B framework informed the survey design for the study where Bennett et al. (2021) discussed that the application of the behaviour change wheel framework allowed systematic investigation of the factors related to auditory rehabilitation. By using the COM-B model as a framework for this research, the authors could identify what areas needed to be targeted in order to promote improved auditory rehabilitation (Bennett et al., 2021). In terms of capability, participants reported having sufficient knowledge and skills but a lack of training and practise of service delivery. In order to promote behaviour change, training and clinical practice time would be needed to support clinicians' capability. Participants also reported lack of support, time and resources in relation to opportunity. The authors noted that perhaps environmental restructuring to provide more time, resources and planning, would be needed to derive behaviour change (Bennett et al., 2021). Finally, participants reported lack of habit recommending and using the rehabilitation programme as a motivational barrier in addition to the perception of the programme not being financially worthwhile. If behaviour change is to be successful in this instance, perhaps goal setting needs

to be implemented to develop habitual use and intrinsic motivation. This is applicable to the current study, as the COM-B framework provided guidance to analyse what components would influence teachers and SNAs behaviour when using Lámh in Irish mainstream education. The study by Bennett et al. (2021) is a positive addition to the area of research concerned with behaviour change due to the strong methodological design. While the sample size might be considered small in the context of the overall Australian population, the authors noted this and perhaps future research could expand on this study and recruit a wider representation of the population.

A similar design was adopted by Patel et al. (2022) to investigate the impact of COVID-19 on digital practice in paediatric SLT services in the UK. Eight SLTs participated in an initial focus group to support design of the questionnaire. Following inductive thematic analysis of the focus group, a series of themes and subthemes were used to create Likert scale, rating and open-ended questions in the questionnaire. This research by Patel et al. (2022) demonstrates a well thought methodology. The incorporation of an initial focus group to facilitate effective questionnaire design was particularly useful, allowing for a coherent data set to be collected. Four hundred and twenty four SLTs participated in this study by completing the online questionnaire. The open-text responses in the questionnaire were analysed using a deductive framework based on the COM-B model. Psychological capability was prominent, with SLTs feeling they had increased digital knowledge which would support their practice going forward. However, they expressed the desire for more access to ongoing support via training and materials. Both physical and social opportunity were discussed as influential. In terms of physical opportunity, participants felt the success of digital practice was dependent on the extent to which technology met the needs of the SLTs and their clients in addition to the funding made available. Digital practice relies on specific high-tech technology which is often costly. Family support and team support were noted in relation to social opportunity. Clinical practice

via telehealth requires support from a client's family to help build and maintain clinical interaction. Reflexive and automatic motivation were noted also. Technology has the potential to provide increased communication support by building a habit. In addition, technology might not be appropriate in all communication scenarios and thus not motivating to continue using (Patel et al., 2022).

2.3 Summary and research questions

The aim of this study was to establish which components of the COM-B model would enable behaviour change to implement the use of Lámh by teachers and SNAs in mainstream primary schools. By applying a behaviour change model to the design of a questionnaire and to inform questions asked during focus groups, the researcher was able to identify which aspects of capability, opportunity and motivation impact behaviours related to use of Lámh. Similar to work completed by Bennet et al. (2021), Patel et al. (2022) and Law et al. (2021), the aim was to later inform considerations for designing a mainstream school specific Lámh course in the future.

The specific research questions were:

1. Within the context of the COM-B model,

    a) what factors, specifically in relation to stakeholder's capability, opportunity and motivation, influence the use of Lámh in the classroom setting?

    and

    b) what similarities and differences are evident in how these factors of capability, opportunity and motivation influence teachers compared to SNAs' use of Lámh in the classroom setting?

Chapter 3 Methodology

3.1 Research Design

A qualitative approach was employed in this study to apply the components of COM-B model to identify factors that would influence staff in their use of KWS with children who use Lámh in mainstream primary schools. The sampling strategy within this research was purposive sampling. The two techniques utilised were a questionnaire and semi structured focus groups. The questionnaire items and focus group questions were anchored in the same context, based on the COM-B model, to improve alignment of these two techniques (Harris and Brown, 2010).

3.2 Ethical considerations

Ethical approval was obtained from the Social Research Ethics Committee (SREC) in University College Cork (See Appendix A). Informed consent was obtained from all participants in the study. This was obtained in writing from everyone before participating in the questionnaire (See Appendix D). In order to ensure participants were fully informed prior to giving consent, an information sheet was provided (See Appendix B). This information sheet included the purpose of the study, what the study would entail, what information would be collected, why the participants were invited, data collection, confidentiality and anonymity, data storage. A video was also shared with participants to outline the details of the study (See Appendix C). Similarly, the participants that engaged in the focus group accessed the information sheet and video and subsequently provided consent (See Appendix F).

Further ethical considerations included procedures for withdrawal from the study and storage of data. Participants were advised that they could withdraw from participation until the point of data submission. As the responses were anonymised, participants would have to withdraw before submitting their final responses. The anonymised data will also be made available on the open science framework (OSF) for potential future analysis upon completion of this study.

3.3 Data collection procedures

In order to thoroughly examine the factors within the context of the COM-B model that influence teacher and SNAs use of Lámh in mainstream school, data collection involved a number or methods. This included a questionnaire and focus groups. Data collection methods will be discussed below.

3.3.1 Questionnaire Development

Firstly, a questionnaire was used to gather a) information about participant demographics, b) the context of when and where Lámh is/was used, and c) how factors relating to capability, opportunity and motivation impact teachers and SNAs use of Lámh. This questionnaire was designed on the Qualtrics platform and available to participants to complete online. The questionnaire took approximately ten to fifteen minutes to fully complete. Guidelines outlined by Gehlbach and Artino (2018) were followed when formulating the questionnaire for this study. This included the avoidance of agree-disagree statements to reduce ambiguous responses and acquiescence bias. The format was aligned with the research question and so the COM-B model guided the design of the questionnaire items. The questionnaire was piloted with two teachers and two SNAs to ensure it was user friendly, easy to follow and addressed the research aims. No changes were made following the pilot of the questionnaire. The questionnaire is described below:

<u>Questions 1 – 3: Demographic information</u>

To ensure participants met the criteria for this study, closed demographic questions were initially outlined as participants could only select their answer from a small number of options. This included questions about participants' occupation, participants' work setting (i.e., mainstream or special school) and participants' experience working with a Lámh user. The participants that did not meet criteria were unable to proceed to the rest of the questionnaire.

<u>Questions 4 & 5: Further demographic information</u>

These questions gathered additional information regarding the class group/s participants worked with and what level of Lámh training they had received. Closed multiple choice questions were used, where multiple responses were permitted.

Questions 6 – 8: Lámh use in school

Question 6 and 7 used closed multiple-choice questions to identify which locations within school Lámh is used and in which activities. Participants also had the option to select "other" where they could elaborate on their response. Question 8 asked participants to identify how often they use Lámh in school using a sliding scale point selection where 1=never used and 10= always used.

Question 9 – 11: COM-B model

Each question in this section was designed using the COM-B self-evaluation questionnaire by Michie et al. (2014) and the Theoretical Domains Framework (TDF) as a guide (See Figure 4). The TDF builds on the systems identified within the COM-B model (Cane et al., 2012) and was designed for use in supporting implementation science (Cane et al., 2012). When analysing or designing intervention, it would not be possible to apply the vast number of behaviour change theories and constructs. Therefore, design of a framework would ensure that critical constructs relevant to the target group in question would be less likely missed (Heslehurst et al., 2014). The TDF domains were considered an appropriate representation of theoretical constructs that may be influential on people's behaviours. The TDF consists of 14 domains which comprehensively groups behavioural theories where constructs overlap (Cane et al., 2012) (See Figure 4). The TDF was not directly applied in the current thesis, however the 14 domains were used to guide the design of the COM-B related questions in the questionnaire and focus groups. Each question also had numerous options to be potentially selected to represent each subcomponent within the model. Question 9 looked at the

components within the capability section of the COM-B model. This included both physical and psychological capability. Question 10 related to opportunity, both social and physical opportunities. Question 11 referred to the motivation component of the COM-B model and included reflexive and automatic motivation. By using this preliminary questionnaire design by Michie et al. (2014) as a basis for the questionnaire in this study, the full range of contributing factors relating to the use of Lámh in schools could be addressed to elicit the necessary information from the participants.

Each question in this section was designed similarly using a multiple-choice format. A set of multiple-choice statements were presented to identify which factors within the components of the COM-B model (capability, opportunity and motivation) that support participants' use of Lámh in school (See Table 1). Participants could select multiple responses here. Each statement began with "In order to use Lámh in the school environment, I would have to…". The free text option was utilised here to allow participants to explain why they chose their responses. The following instructions were given to participants: "Which of these factors would be important to support your use of Lámh in the school setting? (Choose as many options as apply). In each case, use the text box provided to say why you think it might be important for you"'. Participants also had the option to select 'other' at the end of each question, to provide details about a different factor they might consider to impact their use of Lámh in school.

Question 12: Additional information

The final question provided participants with the option of outlining any additional information in relation to supporting their use of Lámh in a mainstream school. This was a free text option question.

Figure 4

Theoretical Domains Framework (Cane et al., 2012)

TDF Domain	TDF Construct Example
1. **Knowledge**	Awareness of procedure, practice or existence of evidence
2. **Skills**	Ability acquired through practice
3. **Social/professional role and identity**	Coherent set of behaviours and personal qualities
4. **Beliefs about capabilities**	Self-efficacy
5. **Optimism**	Confidence that goals will be attained
6. **Beliefs about consequences**	Belief in expected outcomes, anticipated regret
7. **Reinforcement**	Offering of rewards, incentives or sanction
8. **Intentions**	Conscious decision to perform a behaviour
9. **Goals**	Prioritising goals, action planning and expectations of implementation
10. **Memory, attention and decision processes**	The ability to retain information, maintain attention and make informed choices
11. **Environmental context and resources**	Awareness of environmental stressors, barriers and facilitators
12. **Social influences**	Awareness of social norms and interpersonal processes
13. **Emotion**	Reaction pattern towards environmental events

14.	**Behavioural regulation**	Managing or changing actions

Table 1

Multiple Choice Statements and corresponding Coding Categories

Question 9: Capability	
Category Code	**Multiple Choice Statement**
Psychological capability	
Importance and benefits	In order to use Lámh in the school environment, I would have to know more about why Lámh is important, for example the benefits of using Lámh with children with communication difficulties.
Integrating Lámh	In order to use Lámh in the school environment, I would have to know more about how to integrate Lámh into daily activities throughout the school day, for example how I can use Lamh signs during circle time
Range of available signs	In order to use Lámh in the school environment, I would have to know more about the range of Lámh signs available, for example the signs for different school related vocabulary
Accessing Signs	In order to use Lámh in the school environment, I would have to know more about where to access Lámh signs, for example what books, videos or online resources can I use to access Lámh
Resources Available	In order to use Lámh in the school environment, I would have to know more about resources available to support the use of Lámh in schools, for example where to find appropriate books/courses to support my use of Lámh

Supporting Lámh user	In order to use Lámh in the school environment, I would have to know more about how to encourage the Lámh user to use Lámh to communicate throughout the day, for example e.g., create my teaching and learning activities in a way that the Lámh user can respond and participate using Lámh
Supporting peers	In order to use Lámh in the school environment, I would have to know more about how to encourage peers to use Lámh, when communicating with a Lámh user, for example how to support other children to use Lámh when communicating with the Lámh user
Mental Stamina	In order to use Lámh in the school environment, I would have to have more mental stamina to use Lámh in school, for example have capacity to maintain the mental effort required to keep using Lámh throughout the day
Supportive environment	In order to use Lámh in the school environment, I would have to have a supportive environment to overcome obstacles, for example a greater support system to navigate obstacles to using Lámh in the school environment
Barrier	
Physical capability	
Physical skills	In order to use Lámh in the school environment, I would have to have the physical skills to make the Lámh signs, for example be able to manipulate my hand movements in to the shape of the sign, co-ordination skills
Physical stamina	In order to use Lámh in the school environment, I would have to have more physical stamina to use Lámh in school, for example have the

	physical strength required to keep using Lámh throughout the school day
Knowledge of making the signs	In order to use Lámh in the school environment, I would have to know more about how to make the Lámh signs, for example the steps and hand actions to complete Lámh signs

Question 10: Opportunity

Category Code	**Multiple Choice Statement**
Physical opportunity	
Time to integrate Lámh	In order to use Lámh in the school environment, I would have to have more time to integrate Lámh into the tasks I do as a teacher/SNA, for example create dedicated time during the day
Time to plan Lámh use	In order to use Lámh in the school environment, I would have to have more time to think about how to ensure the Lámh user can respond/engage in class through the use of sign, for example time to include Lámh in lesson and activity plans
Materials	In order to use Lámh in the school environment, I would have to have the necessary materials to support: teaching Lámh / children's continued use of Lámh / my use of Lámh, for example access to teaching supports and personal support for using Lámh in school
Triggers and reminders	In order to use Lámh in the school environment, I would have to have more triggers to prompt my use of Lámh, for example visuals to serve as a reminder for my use of Lámh

Financial gain	In order to use Lámh in the school environment, I would have to have the ability to earn more money as a result of using Lámh, for example a higher salary if I use Lámh
Barrier	
Social Opportunity	
Support from others	In order to use Lámh in the school environment, I would have to have more support from others to use Lámh, for example support from colleagues to use Lámh
Use of Lámh by others	In order to use Lámh in the school environment, I would have to have more people around me using Lámh, for example all children and staff in class using Lámh
Barrier	

<u>Question 11: Motivation</u>	
Category Code	**Multiple Choice Statement**
Automatic motivation	
Feel that I want to sign	In order to use Lámh in the school environment, I would have to feel that I want to sign enough, for example get a sense of satisfaction or pleasure from it
Feel that I need to sign	In order to use Lámh in the school environment, I would have to feel that I need to sign enough, for example care more about the negative consequences of not doing it
Believe that signing is a good thing to do	I would have to believe that signing would be a good thing to do, for example have a stronger sense that I should do it

Reflective Motivation	
Develop better plans	In order to use Lámh in the school environment, I would have to develop better plans for signing, for example have clear/better developed plans for achieving it
Develop a habit	In order to use Lámh in the school environment, I would have to develop a habit of doing it, for example get into a pattern of doing it without having to think about it

3.3.2 Focus Groups

Secondly, a series of focus groups were conducted in order to delve further into the use of Lámh in the school setting and to support the researcher's interpretation of the questionnaire results (Tausch & Menold, 2016). A focus group can be described as a group of people that possess certain characteristics (in this case, they are teachers or SNAs with experience using Lámh in a mainstream primary school), that provide data of a qualitative nature in a focused discussion to allow for exploration of people's experience and the significance of same (Krueger & Casey, 2014; Dilshad & Latif, 2013; Wilkonson, 2018). To identify whether there were differences of opinions amongst teachers and SNAs, four focus groups were held online, two to represent each occupation. Four participants were involved in each focus group, which all lasted between 50 and 60 minutes. The moderator, in this case the student researcher, introduced the topic and opened the discussion to participants. The Microsoft Teams platform was used to facilitate the focus groups. The sessions were audio recorded within the Microsoft Teams platform and the responses from the participants were transcribed verbatim within this platform during the sessions to ensure accuracy. A semi structured interview schedule was used to guide the group. Guidelines outlined by Anderson (1990) were followed when constructing questions for the focus group interviews: 1) use open-ended questions, 2) questions should be

of qualitative nature, 3) avoid questions with a ‘yes’ or ‘no’ answer, 4) avoid use of a directive approach and 5) sequence questions in a natural flow. The focus group questions were based on the questionnaire, where specific questions relating to the COM-B model were asked (See Appendix G). The focus group questions were designed to gather further insight into specific areas relating to capability, opportunity and motivation that required a more in-depth discussion amongst participants allowing the researcher to obtain insight to participants lived experiences of using Lámh. The purpose of the semi structured questions were to guide participants and follow through with further inquiry where appropriate (Galetta & Cross, 2013). As outlined by Galetta et al. (2013), it was important to clarify points made by the participants during the discussions to ensure accurate data was obtained. In addition, participants were reminded that there were no correct or incorrect answers, and they were encouraged to converse with one another and to feel comfortable to agree or disagree where necessary (Galetta et al., 2013). Focus groups were chosen instead of semi structured interviews as the group process would be advantageous to support participants to identify and clarify their views (Tausch & Menold, 2016). Casey et al. (2000, p.11) outline that focus groups provide “a more natural environment than that of individual interview because participants are influencing and influenced by others-just as they are in real life”. In this case, the participants were teachers and SNAs that use Lámh in a mainstream primary school. The contact details of the student researcher were provided at the end of the questionnaire, and those that emailed the student researcher to volunteer for the focus groups were selected once the inclusion criteria was met.

3.3.3 Data collection schedule

Data collection for the questionnaires took place over a 6-month period, between January and July 2023. Collection of the focus group data took place between September and October 2023. By waiting until the third quarter of the academic year to begin data collection, ample time and opportunity was given to staff to gain experience using Lámh in the school

setting with a Lámh user in their class. This supported the participants to be able to reflect on using Lámh and the potential influence factors within the COM-B model may have on their use of Lámh.

3.4 Recruitment and Participants

A sampling method to gather an in-depth understanding of the factors that influence teachers and SNAs in their use of KWS with children who use Lámh in mainstream primary schools was necessary. Purposive sampling was employed to fulfil this requirement and recruit participants with experience of using KWS. Keeping in line with such purposive sampling, practitioners across all class groups within primary school were sought to participate in this study. This would provide a more holistic representation of the use of KWS across different class groups with children of different ages and at different stages in their education journey. In order to increase the number of potential participants, recruitment took place in January 2023, so that those who had only been using KWS since the beginning of the academic year, could also be in included and had some time to become familiar with using signs. Initial contact with potential participants was facilitated by gatekeepers, who were principals of Irish primary schools and speech and language therapists in local disability services, in line with best practice guidelines in qualitative research (Clarke & Braun, 2013). The researcher contacted the principals of local mainstream primary schools to share the information sheet (See Appendix B), subsequently expanding the search across Ireland via email. The researcher contacted the Irish National Teachers' Organisation (INTO) and National Association of Principals and Deputy Principals (NAPD) to distribute the questionnaire among their staff. Further recruitment occurred via snowball sampling, where participants shared the questionnaire with colleagues. Social media was also utilised to support recruitment. The student researcher created a video demonstrating a range of KWS to deliver a message for potential participants (See Appendix C). The information sheet was circulated via different social media platforms

including Facebook, Instagram and Twitter. The information sheet highlighted the following inclusion and exclusion criteria.

Inclusion criteria:

1. Teachers who (a) currently have a child who uses Lámh in their class in mainstream primary school from junior infants to sixth class or (b) previously had a child who used Lámh in their class in mainstream primary school from junior infants to sixth class,
2. SNAs who (a) are currently assigned to a child who uses Lámh in mainstream primary school from junior infants to sixth class or (b) were previously assigned to a child who used Lámh in mainstream primary school from junior infants to sixth class.

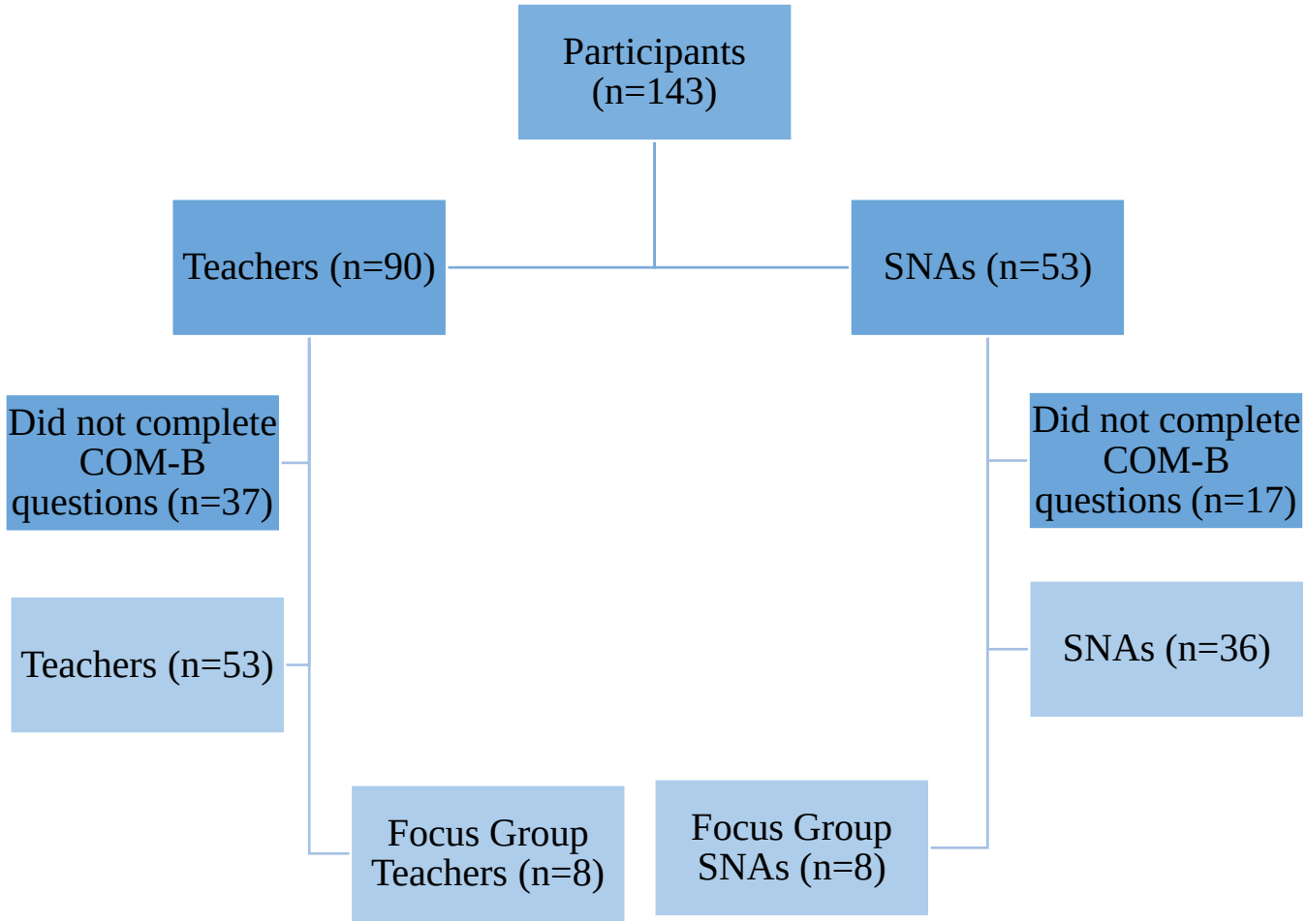
The following exclusion criteria apply:

1. Student teachers or SNAs who were not yet fully qualified,
2. Teachers or SNAs who worked in secondary schools.

Further exclusion of participants was applied as 54 participants only completed the demographic component of the questionnaire and didn't go on to complete the questions relating to the COM-B model, in the main part of the questionnaire (See Figure 5 Screening of participants).

Figure 5

Screening of participants



3.5 Data analysis

Data for the questionnaire responses were exported from Qualtrics and stored on a UCC supplied Microsoft OneDrive. The data was analysed using descriptive statistics and directed deductive content analysis (Clarke & Braun, 2013, Vaismoradi et al., 2013). Deductive content analysis was chosen as a structural approach using prior theoretical knowledge was appropriate in the context of applying the COM-B model in this study. Employing a directed content analysis approach guides the process of analysis based on pre-existing theories to identify key concepts as initial category codes (Hsieh & Shannon, 2005). The process of directed content analysis outlined by Hsieh & Shannon, 2005 was followed:

1. Predetermined codes are identified for analysis: In the case of the current study, the COM-B model was used to formulate questions, so the key concepts of each multiple-choice question in Question 9 to 11 were identified as the pre-determined coding categories (see Figure 5).
2. The data is coded immediately using such predetermined codes: The data obtained in Q9 – Q11 COM-B model multiple choice questions were coded under the predetermined question codes. Data from Q12 where participants could provide 'other' information was analysed and coded accordingly using the same codes as above where appropriate. Similarly, the free text data obtained in the focus group transcriptions were coded using the same predetermined codes.
3. Identify data that cannot be coded and determine if this is representative of a new category or subcategory of an existing code: All data could be coded using the predetermined codes outlined at the outset for the questionnaire responses However, some data from the focus group required further analysis when codes could not directly be applied. This involved an element of thematic analysis, where themes outside of the predetermined codes emerged, for example 'barriers'.

3.6 Rigour

This study involved a mixed methods approach in terms of both data collection and analysis. To ensure trustworthiness during this research process and ensure confidence in the methods used for data collection and interpretation, numerous steps were taken (Polit & Beck, 2014). These steps include credibility, dependability and confirmability (Polit & Beck, 2014). These measures will be outlined below.

To ensure credibility in this study, the use of multiple methods and data sources was availed of to ensure the development of a comprehensive understanding of phenomena and apply balance (Carter et al., 2014). Two methods of data collection were employed, a

questionnaire and focus group interviews. Focus group interviews were used in addition to the questionnaire to provide scope for a more in-depth analysis of the components within the COM-B model that influence teachers and SNAs use of Lámh in a mainstream primary school (Polit & Beck, 2014). Data also derived from different sources as different groups of people were involved 1) teachers and 2) SNAs, which further ensured credibility was upheld (Carter et al., 2014).

It was also important that dependability was upheld during the course of this study, ensuring that the findings were consistent (Tuval-Mashiach, 2017). The researcher in qualitative research is responsible for data collection and analysis, and therefore contextual knowledge, biases, assumptions, and interpretations can all potentially impact studies of this nature (Tuval-Mashiach, 2017). The researcher is a speech and language therapist, with a keen interest in Lámh, total communication and paediatric disability. The researcher has extensive experience using Lámh, as do the teachers and SNAs that participated in this study. Interest and experience with Lámh may have served as bias to participate, but this did not extend to the procedures or analysis process within this study. While the interests of the researcher are central to the investigations of this study, the steps described above ensured that credibility, transparency, dependability and confirmability were upheld at all times during the study, and no potential biases influenced procedures or analysis. Transparency was addressed in this study by describing the research process in detail to include development of the research question and the process in which data was collected, extracted and analysed (Tuval-Mashiach, 2017). With the support of the research supervisors, strengths and limitations of the processes could be discussed and addressed where necessary.

Finally, confirmability was ensured by applying the process of inter-rater reliability during the data analysis phase. The researcher acknowledged that there can be differences between individuals when interpreting text. The data was double coded to support

trustworthiness. This involved a second researcher, one of the supervisors of this study who is also a speech and language therapist, extracting 20% of the data which was randomly selected and coded this data independently to interrogate the work. When this was complete, agreement was calculated based on the number of codes agreed, compared to the original extraction made by the primary researcher. Initial inter-coder agreement was 58%. This was mostly due to similar codes being representative of different categories and the specific category was not outlined in the extraction data set leading to some confusion, for example 'resources' referred to needing the knowledge of what resources were available (psychological capability) whereas 'materials' was concerned with having access to the necessary materials (physical opportunity). The student research was very familiar with the codes and potential components within the COM-B model whereas the second coder did not have as much experience and thus the lack of explicit category information provided in the initial data extraction document led to a lower rate of inter-coder agreement. All discrepancies were discussed and consensus was reached following this deliberation. One key point noted in the differences was the variation between components of capability, opportunity and motivation. Some of the data was also better suited to be coded as a barrier, separate to any of the specifically outlined COM-B model components. The process of double coding was completed again and 97% agreement was reached.

To further support this reflexivity piece, the researcher aimed to self-consciously critique and evaluate their analysis to ensure subjectivity was not influencing the research process. One way to bring intention to the researchers' viewpoints and presumptions during the research process was by journaling. By keeping an analytical journal and notes, the researcher could engage in reflective practise which supported drawing attention to the processes and further probe decisions. This reflexive practise also allowed the researcher to highlight any gaps in their own knowledge or thinking and engage in self-education and further research where appropriate.

Chapter 4 Results & Discussion

In this section the results will be presented with respect to the questionnaire and focus groups. The demographic information of participants will also be outlined, including what class groups they work with, levels of current Lámh training and experience with Lámh users. These results will then be discussed. For clarity, direct quotations are depicted in italics and double quotation marks. Quotations from participants in the questionnaire are annotated using the letter 'T' or 'SNA' to represent their occupation, with their participant number e.g., 'T7'. Similarly, quotations from participants in the focus groups are represented by the letter 'T' or 'SNA' to represent their occupation, in addition to the focus group they participated in and their participant number e.g., 'SNA2_3'.

4.1 Participant Demographics

A total sample of 305 people opened the questionnaire. Two hundred and ninety-one people indicated their occupation. Teachers represented 141 people, 110 people were SNAs and 40 people selected 'other' for their occupation. The cohort that selected "other" were automatically excluded and could not continue with the questionnaire as they were ineligible. Participants were then asked what setting they worked in, 117 teachers and 73 SNAs were working in a mainstream setting. A further 12 teachers and 36 SNAs stated they worked in a special school setting and were consequently unable to proceed with the rest of the questionnaire. Only 92 participants completed at least one of the COM-B related questions. Given the aim of this study, only the data from the 92 participants that completed at least one of the COM-B related questions, was included in this study. Fifty-five of these responses were from teachers and 37 from SNAs. Ninety-two participants completed the 'capability' section, sixty participants completed the 'opportunity' section (35 teachers and 25 SNAs) and thirty nine participants completed the 'motivation' section. (25 teachers and 14 SNAs).

Table 2

Questionnaire Participant Demographics

Participants Class Group			
Class Group	*Teacher*	*SNA*	*Total %*
Junior Infants	12	12	26%
Senior Infants	11	8	21%
1st class	5	7	12%
2nd class	6	4	11%
3rd class	3	2	5%
4th class	0	2	2%
5th class	0	0	0%
6th class	1	0	1%
Resource Class	12	1	14%
Mix of Class Groups	5	1	7%
Participants Level of Lámh Training			
Training	*Teacher*	*SNA*	*Total %*
Little Lámh	0	2	2%
Lámh Module One	33	33	71%
Family Lámh	4	3	7%
Family Lámh Part 2	1	0	1%
Family Trainer Programme	0	0	0%
Module One Add On	1	6	7%
Lámh QQI Level Five Total Communication	0	2	1%

Lámh Tutor Training	2	0	3%
Informal training from an SLT	7	3	11%
No training	12	1	14%
Experience of Working with a Lámh user			
Occupation	*Currently working with a Lámh user*	*Previously worked with a Lámh user*	*Had concurrent and previous experience working with a Lámh user*
Teacher	26	28	1
SNA	27	10	0
Total	53 (57%)	38 (41%)	1 (1.1%)

Table 3

Focus Group Participant Demographics

Teacher Focus Groups			
Participant	*Class Group*	*Lámh Training*	*Experience with a Lámh user*
Teacher 1_1	Junior Infants	Little Lámh	Current
Teacher 1_2	Resource Class	Lámh Module One	Current
Teacher 1_3	Senior Infants	Lámh Module One	Current
Teacher 1_4	Second Class	Lámh Module One	Previous
Teacher 2_1	Junior Infants	Lámh Module One	Current
Teacher 2_2	Junior Infants	Lámh Module One	Current

Teacher 2_3	Senior Infants	Little Lámh	Previous
Teacher 2_4	Resource Class	Little Lámh	Current
SNA 1_1	Senior Infants	Little Lámh	Current
SNA 1_2	First Class	Lámh Module One	Previous
SNA 1_3	Junior Infants	Lámh Module One	Current
SNA 1_4	First Class	Lámh Module One	Current
SNA 2_1	1st class	QQI Level 5	Current
SNA 2_2	Junior infants	Lámh Module One	Current
SNA 2_3	Junior infants	Lámh Module One	Current
SNA 2_4	Senior infants	Lámh Module One	Current

4.1.1 Teachers

4.1.1.1 Questionnaire Participants. A total of 55 teachers completed all sections of the questionnaire. A similar number of teachers reported that they were either currently working with a Lámh user (n=26) or have previously worked with a Lámh user (n=28). One teacher reported both currently and previously having worked with a Lámh user. Some teachers were actively teaching class groups while others were in post as resource teachers (See Table 2). Teachers working in junior infants, or a resource class represented the most common class groups with 12 working in each, followed by senior infants being the second most represented class (11 teachers). Fewer teachers who responded worked in the class groups of 1st to 3rd class, with only 5, 6 and 3 teachers respectively for each class. Only one teacher worked with senior primary classes. Lámh training was variable amongst teachers (see Table 2). The most common training availed of was the Lámh Module 1 training (n=33), which covers a core vocabulary of

100 signs, with 60% of teachers completing this. There were other teachers that reported higher levels of training such as the Lámh Module One Add On course (n=1) and the Lámh Tutor training course (n=2). Others received training from an SLT (n=7) while some teachers also reported no training (n=12).

4.1.1.2 Focus Group Participants. Eight teachers participated in the focus group (see Table 3). All teachers were female, ranging in age from mid-twenties to mid-forties. Most of the teachers worked with infant or resource class groups. One teacher completed Little Lámh, six of the eight teachers completed Lámh Module One training, and one had not completed any training.

4.1.2 Special Needs Assistants

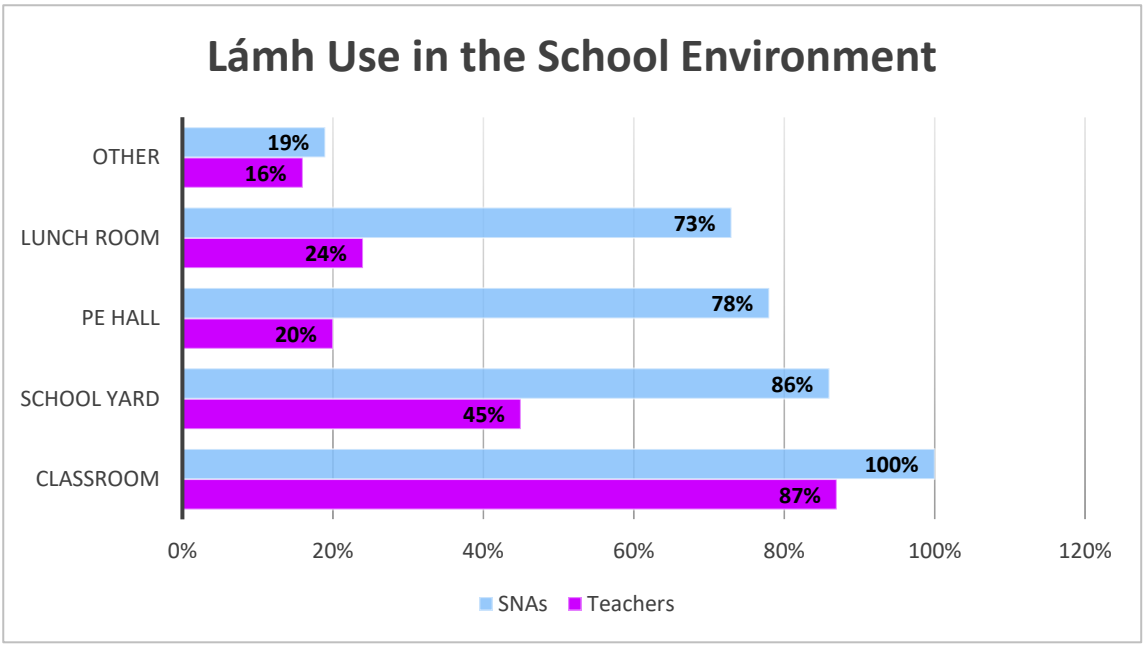
4.1.2.1 Questionnaire Participants. A total of 37 SNAs completed the questionnaire (See Table 3). Twenty-seven SNAs were currently working with a Lámh user and ten SNAs previously worked with a Lámh user. Like the cohort of teachers, the most common class group for SNAs was also the infant classes, with 12 working in junior infants and 15 across senior infants and first class. Fewer SNAs who responded worked with the class groups of 2nd and 3rd class, with 4 SNAs in 2nd class and 2 SNAs in 3rd class. Two SNAs worked in the senior classes of 4th to 6th class. One SNAs reported working with a resource class group. As was the case with teachers, the most popular Lámh training completed by SNAs was the Lámh Module 1 training (n=33), so 94% of staff had a baseline knowledge of at least 100 signs (See Table 2). The second most prevalent training accessed by SNAs was the Module One Add On, with 6 SNAs completing this. Two SNAs had completed the Lámh QQI Level 5 Total Communication course, while 3 received training from an SLT and 1 had no training at all.

4.1.2.2 Focus Group Participants. Eight SNAs participated in the focus group (see Table 3). All SNAs that participated in the focus groups were female, ranging in age from late

twenties to early fifties. The SNAs in the focus group worked with younger class groups from junior infants up to first class. Of the 8 SNAs, one had completed Little Lámh, 6 SNAs completed Lámh Module One training, and one had completed the QQI Level 5 Total Communication training. Overall the level of training was very similar across both cohorts. Teachers and SNAs most commonly had completed Lámh Module One.

Figure 6

Lámh use in the school environment



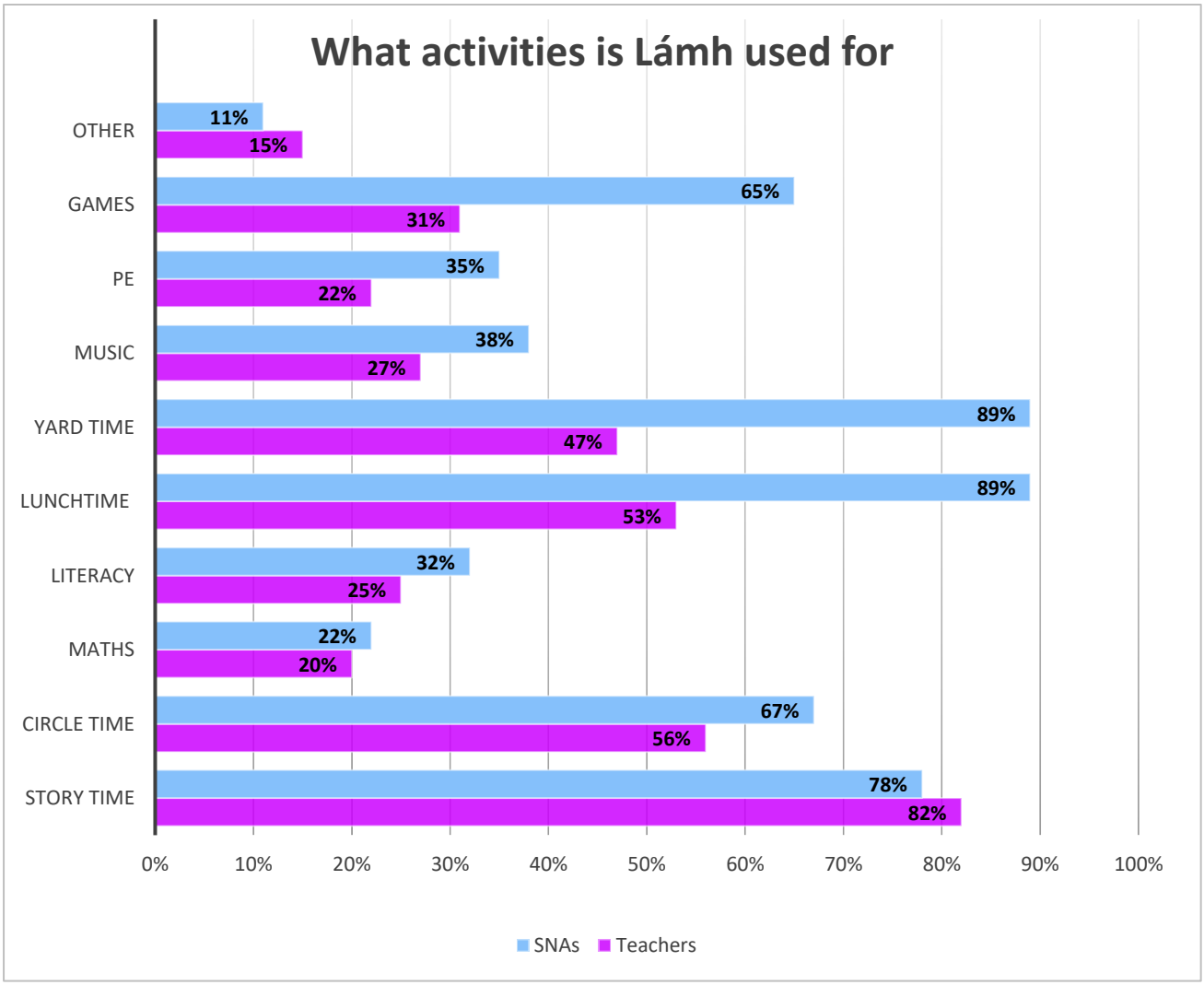
4.1.3 Use of Lámh in school environment

Participants reported use of Lámh in various school environments and could select multiple options for this question. The most common area Lámh was reported to be used in was in the classroom, with 100% of teachers and 87% of SNAs reporting this. These results are similar to findings by McDowell and Bornman (2022) who investigated KWS in African schools. McDowell and Bornman (2022) noted that the use of signs by school staff is more likely in structured activities within the classroom. In the current study, SNAs reported to use Lámh in environments external to the classroom more than teachers, for example the PE hall. Seventy eight percent of SNAs reported Lámh use in the PE hall compared to 20% of teachers.

The difference in response here could be attributed to the difference in the roles/responsibilities of a teacher and versus those of an SNA. SNAs also support children in contexts external to academic activities such as PE or in the yard and thus, may use more signs in these environments. There was also the option of 'other' where participants were asked to give an example. Two teachers and two SNAs reported using Lámh *"everywhere"* and *"in all areas of school"*. Four teachers outlined the example of *"during SEN (special educational needs) time"* or in the *"support class"*. Two SNAs also noted the use of Lámh "*on school trips"* or "*during help with toileting*" (See Figure 6).

Figure 7

Activities Lámh is used for in the school setting



4.1.4 Activities Lámh is used for

Participants were subsequently asked to outline what activities in school they use Lámh for, where they could choose more than one response from the list of multiple-choice options. Story time was the most commonly selected choice for teachers, with 82% of teachers noting they use Lámh at story time (See Figure 7). Seventy eight percent of SNAs also reported using Lámh during story time. Again, the examples of story time and circle time which are structured activities are similar to the findings by McDowell and Bornman (2022) as common vocabulary can be easily signed. These are also activities that take place daily. Only 20% of teachers and 22% of SNAs reported using Lámh in maths. This may be due to the specific numerical and maths related vocabulary used which staff may not have the signs for. A surprising results was the low rate of staff responses related to PE. Twenty two percent of teachers and 35% of SNAs reported using Lámh in PE when in fact there are lots of instructional signs that may be used in this type of activity. The use of Lámh during lunch time and yard time was reported by 89% of SNAs for both activities, compared to 53% and 47% of teachers respectively. SNAs employ a different role when working with children, often focused on caring for a child's needs beyond education. In addition when supporting education they tend to do so on a one to one basis (Keating & O'Connor, 2012). This difference was reflected in participant responses, as SNAs reported using Lámh in more activities external to academics. This includes games where a higher percentage of SNAs (65%) reported using Lámh compared to teachers (31%). In the 'other' responses option, a number of participants specified using Lámh in *"Gaeilge",* while others outlined they used it during *"SEN time".* One SNA stated *"I think I use more signs in less academic activities"* while another noted *"I try to incorporate Lámh into all aspects of the school curriculum"*.

4.1.5 Frequency of Lámh use

Participants were also asked "How often do you use Lámh" in general in the school environment, where a sliding scale was used to obtain responses from 1 (never) to 10 (always) to establish the frequency of Lámh use in schools. The mean response was 6 for teachers, with a range of 1-10. While for SNAs, the mean response was 8 and the range was from 4-10. This indicates that while most participants use Lámh frequently in school, SNAs reported more frequent use than teachers. This relates to the findings above which outlines SNAs use of Lámh in more environments and activities in school compared to their teacher counterparts. More specifically, this relates to findings by O'Leary et al. (under review) where the experiences of Lámh by teachers and SNAs was investigated across four time points within one academic year. O'Leary et al. (under review) noted that SNAs demonstrated elements of intrinsic motivation development. The use of Lámh became more habitual for SNAs in particular based on the interview responses in O'Leary et al. (under review) and perhaps this was a contributing factor in the current study also resulting in higher frequency of Lámh use by SNAs.

4.2 Findings from COM-B related questions

The primary research question aimed to identify what factors would influence mainstream staff to use Lámh in the classroom setting, within the context of the COM-B model and how these factors compare between teachers and SNAs. Appendix H outlines the number and percentages of participants in each cohort that selected each multiple-choice option relating to a) capability (Question 9), b) opportunity (Question 10) and c) motivation (Question 11). Participants also provided explanations for each choice of statements and examples of such explanations are also represented in Appendix H. Where appropriate, quotes from the focus groups were also assigned to the predetermined themes based on the subcomponents of the

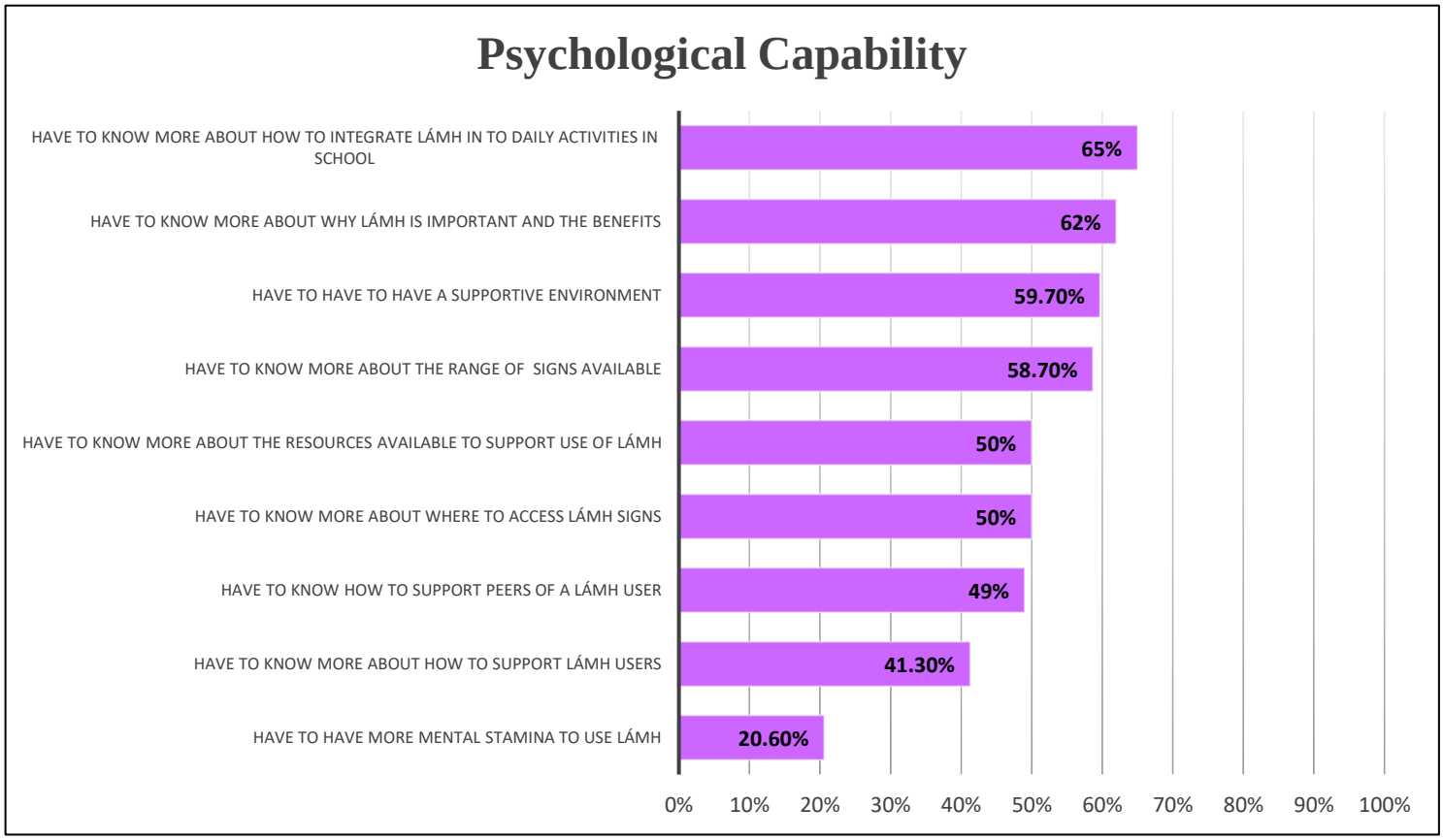
COM-B model. Some barriers to using Lámh in mainstream school were also identified, and these will be discussed later in this chapter.

4.3 Capability

Ninety-two participants answered the question relating to the capability component of the COM-B model in the questionnaire. The construct of capability is divided in to psychological and physical capability. Within this section, more participants selected factors that related to psychological capability than physical capability.

Figure 8

Psychological Capability Questionnaire Results (In order to sign more in school I would….)



4.3.1 Psychological Capability

There were nine response options in the psychological capability section of the questionnaire (listed in Figure 8).

4.3.1.1 In order to sign more in school I would have to know more about how to integrate Lámh in to daily activities. As outlined in Figure 8, the most commonly selected option within the psychological capability component of the survey was having to know more about how to integrate Lámh, which 65% of staff reported. Examples of supporting statements were "*I would have to have practical examples of the use of Lámh in daily activities to help me to make Lámh an integral part of the day"* T15 and "*I would have to know how to adapt activities to allow for integration of signs"* SNA34. Similar findings were outlined by O'Leary et al. (under review) where the perceptions and experiences of Lámh were investigated. Teachers in particular felt that there was no pedagogical framework to teach Lámh. The participants lacked the knowledge of how to go about integrating Lámh in the classroom and how to approach this aspect. These findings suggest that while training needs to provide staff with the knowledge of how to make the signs, the broader aspects of using Lámh such as integrating signs into daily tasks and embedding Lámh into the educational curriculum require attention. This will be discussed further in relation to training later in this chapter.

4.3.1.2 In order to sign more in school I would have to know more about why Lámh is important and the benefits. Sixty two percent of staff in the questionnaire noted that having knowledge of the importance and benefits of Lámh would impact their use of signs, with one SNA stating "*The difference in communication is evident when Lámh is used vs not used so this helps me use Lámh as I know the benefits"* SNA18. Participants across all four focus groups also spoke about the importance and benefits of Lámh in relation to their capabilities. Some participants outlined the value of using it for inclusion, *"It is so important for inclusion to be aware of Lámh"* SNA2_1, *"it is vital for inclusivity"* T2_2 and *"I think it helps support*

inclusion and access to the curriculum" SNA1_2. Other participants showed a deeper understanding of the importance of Lámh in relation to psychological capability. SNA2_4 noted *"You would need to know that it is not just about using the signs there is so much to consider"* and *"It would help to understand it can reduce breakdowns and frustration also"* SNA1_2. This is in keeping with findings from McDowell and Bornman (2022) and Cologan and Mevawalla (2018) who both investigated KWS use amongst teachers. Both studies found that teachers believed KWS was most useful to support language development and shared communication. Findings in the current study align with this, which highlights that knowing more about the importance of Lámh and the benefits of using signs is an important element when considering behaviour change. Staff may feel more capable to use signs when they have a deeper knowledge of the background to signing and the potential advantages. This shows that perhaps elements of the theory of sign use and associated benefits could be included as part of a training programme for teachers and SNAs to support positive behaviour change. This also aligns with findings from additional implementation science studies that concentrate on the classroom setting, where an awareness and knowledge of SLCN is central to the understanding of a communication tool and the use of same (Gallagher et al., 2023).

4.3.1.3 In order to sign more in school I would have to have a supportive environment. Almost 60% of staff in the questionnaire reported they would need a supportive environment in order to feel capable of using Lámh in the school environment. Some staff shared their current/previous experience of a supportive environment on Lámh use. One teacher outlined *"The whole school needs to know the fundamental information about Lámh for it to be successful, in my experience, there are many mainstream teachers who don't know what Lámh is or why it would be used....e.g. for all the teachers who have never had a Lámh user on their class or have never got the grounding in total communication you get from the module 1 training. If all staff (SNA and teachers) were armed with this information, this would make is*

so much easier to implement a Lámh signing environment" T4. Another teacher reported *"Yes the support system in school helps using it, we can navigate the obstacles as a team (me, SNA, principal, resource teacher and SLT collaborating)"* T30. Other staff members outlined what they would need in order to implement this, for example *"I would have to have a supportive network of colleagues"* T11. The idea of a supportive environment was discussed further in the focus groups where participants shared that this related to both inclusivity and a whole school approach to using Lámh. Some quotes include "*You can't just have inclusivity in one classroom it needs to extend to the yard and other classes"* T1_2, *"You need a whole school approach to using signs"* T2_2 and *"I would love Lámh to be brought into all schools so we would all be in tune"* T1_4. In this study, provision of a supportive environment was identified as a potential enabler to uptake of a non-aided gesture system. This finding is echoed in other implementation science literature relating to the classroom environment, where staff outlined school team collaboration as a determinant to successful implementation of AAC related interventions (Biggs & Hacker, 2021). Similarly, findings by Gallagher et al. (2023) who investigated implementation science and universal school based interventions highlighted that the school culture is influential in the uptake and effective implementation of new interventions. When investigating mainstream staff experiences of Lámh, O'Leary et al. (under review) also shared findings which were similar, whereby teachers and SNAs noted the emergence of a whole school approach to using Lámh was crucial to the successful use of signs in the school environment. Signs can be used irrespective of a Lámh user being in the class and other class groups and colleagues using signs creates a more supportive environment, promoting inclusion. The establishment of this supportive environment may be a precursor to behaviour change. If teachers and SNAs are surrounded by a whole school approach, they may feel more capable to use Lámh consistently. These findings relating to a supportive environment were also in line with Sheehy and Budiyanto (2014) who investigated teacher's attitudes relating to signing for

children with disabilities. The findings of Sheehy & Budiyanto (2014) highlight that inclusion can be supported through the use of KWS by all children and staff within a school environment, thus increasing awareness. In one focus group in particular, there was a discussion about the general lack of awareness of what Lámh is amongst teachers. Participant T2_3 outlined *"some teachers know nothing about Lámh, they need to be educated more"*, while participant T2_2 agreed *"it is never touched on in college and it is such a shame"*. This was also highlighted in further findings by Sheehy and Budiyanto (2014), where mainstream staff felt that to help build awareness, training would be a beneficial addition to be included as part of in-service tuition. The group also felt that unless people knew about it, they would not use it and *"the more people that use it, the more momentum it will gather"* T2_4. Similarly, Carroll et al. (2021) who explored Lámh use by different communication partners, outlined one key theme of their study relating to participants longing for more. Parents and school staff felt that awareness around Lámh needed to be increased to fully support implementation in different aspects of life. This highlights that staff may require a consistent supportive environment where Lámh is known and accepted, to help people continue to use signs and change their behaviour.

The idea of a having a supportive environment was presented within the component of capability, as it would enable staff to be capable of implementing Lámh by having a greater support system. However, there is also a potential crossover between a supportive environment and the components of opportunity, whereby support from others may also contribute to a supportive environment. Having enhanced inclusivity and a whole school approach to using Lámh is likely to impact staffs' social opportunity to use Lámh. Staff may benefit from more support from others and there is a greater likelihood that others' use of sign will be increased. The same can be said for motivation. If staff are working in a supportive environment, perhaps they will feel more motivated to use signs and feel more driven or inspired to continue using Lámh. Overall, the concept of social capital can be considered, and this spans across all three

components of the COM-B model. Engagement of teachers with one another in both formal and informal situations often involves meaningful interactions that can contribute to the development of social capital in the school environment (Demir, 2021). Trusting relationships and supportive networking has the potential to create a supportive environment, which is valuable to teachers and SNAs when considering Lamh use as outlined in the findings of the current study.

4.3.1.4 In order to sign more in school I would have to know more about the range of signs available. Over 58% of staff in the questionnaire reported needing to know the range of available signs as an important factor, with supporting statements such as "*I would have to know more about more school related vocabulary"* T24*, "I would have to know more school related signs to support use in the classroom"* SNA34 *and "I would need to know a wide range of signs to be capable of fully using Lámh"* SNA19. This result relates to findings by Frizelle & Lyons (2022) who explored what the core vocabulary should be in a school specific signing course. The recommended core school-based vocabulary was compared to Module One which is currently included in the funded Lámh training offered to schools in Ireland. The recommended core vocabulary was larger than the module one 100 word vocabulary set, and included 40 more signs. The two vocabulary sets had only 55 signs in common and the remaining 85 words were signs that are either taught in more advanced Lamh training or words for which there is currently no Lámh sign (Frizelle & Lyons, 2022). As outlined previously, 71% of participants in this study completed Module One training and therefore, they would not know the full range of 586 Lámh signs available. The findings in the current study support Frizelle and Lyons (2022) conclusion that the 100 signs in Module One are not sufficient to fully meet the communication needs of Lámh users and their communicative partners in mainstream primary school. To be capable of implementing Lámh in the school environment, staff would need to know a wider range of signs, in particular school related vocabulary.

4.3.1.5 In order to sign more in school I would have to know more about the resources available to support the use of Lámh. Half of the staff in the questionnaire noted they would need to know what resources were available in order to use Lámh. In the focus group, this was discussed in further detail and participants shared their views on the current resources they know of that are available and what their opinions of these were. The Lámh social media page was referred to as a valuable resource *"The Lámh social media page has greatly improved and the sign a day is a great resource"* SNA2_4. Others felt that while they know what resources are available, they feel these are outdated *"The website is available but again the stuff is quite old on it"* T2_2 and *"Yes the resources look quite archaic, would be good to move with the times"* T2_3. While findings by O'Leary et al. (under review) highlighted similar resources used by teachers and SNAs, the participants did not share views of resources being outdated. Perhaps the difference here could be attributed to different levels of experience amongst staff. While some might have availed of these resources for some time and seek new resources, others might be newer to using Lámh and not be as familiar with the resources yet. Carroll et al. (2021) also explored Lámh use with communication partners of children with Down syndrome, including their parents, teachers, SNAs and SLTs. Carroll et al. (2021) outlined one key theme of 'longing for more' where parents discussed wanting more awareness, resources, courses and training related for Lámh. Interestingly, teachers, SNAs and SLTs did not mention wanting more resources however their longing for more related to reaching the goal of generalising Lámh and having it more widely used. While the COM-B model was not applied in the study by Carroll et al. (2021), there is still a difference in the findings compared to the current study which can be drawn on. In the current study, 50% of staff would need to know what resources they can access compared to the findings of Carroll et al. (2021) where teachers and SNAs did not outline this need, only mentioning the goal of

generalising sign use. The provision of appropriate and engaging resources is vital to equip staff with the relevant knowledge they need to increase their capability to use Lámh.

4.3.1.6 In order to sign more in school I would have to know more about where to access Lámh signs. Fifty percent of staff in the questionnaire also noted they would need to know where to access signs in order to use Lámh in the school environment. Participants in the questionnaire specifically shared examples of some of the ways they access signs including "*I use my manual, follow on Instagram and subscribe to YouTube Silvia Angel. I also purchased the extra add-on words"* SNA5 and "*Having access to the hand book and especially the app on my phone allows me quick revision of an old sign and the ability to learn new signs as the need arises"* SNA9. Rombouts et al. (2017) investigated the use of KWS within the special needs context. Teachers noted that lack of access to KWS materials would hinder consistent use of signs. The idea of increased accessibility was highlighted by participants within the study by Rombouts et al. (2017), with online access being one example of how to improve access to signs. Findings in the current study suggest that while some staff do avail of online access to videos to expand their levels of knowledge or recap on their existing signs, perhaps more teachers and SNAs could use this online platform. As highlighted in findings by Gallagher et al. (2023) relating to implementation science and school-based intervention, access to knowledge and information can have a strong positive influence on implementation of intervention. Accessing signs was discussed further in the focus group but in the context of a barrier to sign use. This will be discussed in more detail later in section 4.6.

4.3.1.7 In order to sign more in school I would have to know more about how to support peers of a Lámh user. A similar level of response was noted with respect to 'needing to know how to support peers of a Lámh user', with 49% of staff choosing this in the questionnaire. Some participants shared their experience of supporting peers of a Lámh user. One teacher reported *"During my time teaching a child using Lámh, I made a conscious effort*

to teach important signs that were used daily to her peers in the class. I found the children really enjoyed using this, they used to call it their secret language!" T10, while an SNA shared ideas of how to support Lamh users *"Start with using a simple sign and a sign that makes the user happy with their peers for example "play" young children adapt easily and when they see how happy the user is being able to communicate will encourage them to learn some more. Introduce 1 new sign a week to the whole class and make it relate to a subject on the curriculum e.g. Easter, chocolate"* SNA8. Other participants outlined why they selected this option, *"Yes, it can be challenging to engage peers with this so knowing more about how to best support and encourage them would be good"* SNA18 and *"Encouraging peers is a different aspect that I feel we don't get as much support with"* T38. Bowles and Frizelle (2016) investigated the attitudes of peers towards the use of KWS where one finding of interest includes the children's difficulty to remember signs. Frizelle and Bowles (2016) speculatively outlined that this could potentially be attributed to the lack of specific training relating to the implementation of signs in schools. Without guidance, staff may struggle to adopt a consistent and structured approach for peers of a Lámh user. Peers are a central communication partner in the classroom and for successful implementation of Lámh, staff require knowledge of how best to support peers of a Lámh user, in addition to the Lámh user themselves. Teachers especially have to cater for the class group as a whole and the Lámh user is just one of these children. To trigger effective behaviour change when considering the use of Lámh in school, staff will need to feel adequately equipped to continue supporting their whole class group with an additional form of communication, which is potentially why supporting peers of a Lámh user was important factor for many participants in this study.

4.3.1.8 In order to sign more in school I would have to know more about how to support Lámh users. In the questionnaire, 41% of staff reported they would need to know more about how to support a Lámh user in order to use Lámh in school. Supporting statements

provided by participants included needing to know how to encourage a Lámh user to sign. One SNA outlined *"This is my biggest issue. The child understands but doesn't really use signs at all. I sign constantly asking him to sign but he never does... occasionally!"* SNA5. Teachers shared "*Although they have Lámh they very rarely use it to ask for help etc. They do answer questions using Lámh"* T5 and *"I would like to encourage the children to respond using Lámh. They understand it, but don't seem to respond using it"* T13. Needing to know how to create communication opportunities to use sign in school was also raised, *"I don't know enough about creating communication opportunities seamlessly"* T28 and *"it would be great to also get more support about how best to create communication opportunities"* T31. Staff in the focus group shared some comments about the link of their own personal knowledge to their support of a Lámh user. One SNA stated *"you need to be proficient yourself before you can fully support a Lámh user"* SNA2. Again, these findings highlight the importance of training needs to be addressed, to ensure staff are equipped with the knowledge of supporting a Lámh user and creating communication opportunities. To change people's behaviour, knowing the signs alone will not suffice.

4.3.1.9 In order to sign more in school I would need to have more mental stamina to use Lámh. Mental stamina was least reported as a factor in relation to Lámh use in schools, with only 20.6% of staff selecting this option in the questionnaire. Some participants provided comments as to why this is not as relevant as other factors, "*Comes naturally in a Lámh environment. If it's a struggle you need to reassess the situation"* SNA2 and "*not applicable really, yes you can forget but it is not a mental burden"* SNA18.

4.3.1.10 Differences in responses between teachers and SNAs relating to psychological capability. Both teachers and SNAs reported similar responses for most aspects of psychological capability and the findings of the current study do not outline many differences in responses between the two cohorts. One notable difference however was in

relation to having to know where to access signs. Sixty percent of teachers reported they would need to know more about where to access signs compared to 35% of SNAs. It is difficult to determine what the exact reason for this difference might be. Perhaps this can be attributed to the difference in levels of training outlined by staff in the demographic questions. Sixty percent of teachers completed Module One compared to 94% of SNAs. To access the range of signs available, staff need to complete the relevant training, i.e. Lámh Module 1 provides access to 100 signs vs Lámh QQI Level Five provides access to 400 signs. Twenty two percent of teachers outlined they received no training, and therefore they may be unaware of where to access signs. Overall this difference highlights the importance of the provision of training for both teachers and SNAs. Contrasting findings are noted by O'Leary et al. (under review). When investigating teachers and SNAs experience of Lámh in the first year of mainstream primary school, O'Leary et al. (under review) outlined that it was SNAs only that discussed limited access to training. While access to signs and access to training are two different items, they go hand in hand with one another as training inevitably impacts access to signs and consequently people's level of knowledge. To ensure behaviour change is consistent across both professions, equal access to training is required in the mainstream school setting.

Another difference evident in responses from teachers and SNAs relates to the mental stamina needing to sign in school. While only 14.5% of teachers felt mental stamina would be relevant to their sign use almost 30% of SNAs outlined this. While the sample sizes were different for both cohorts, there was still more responses from SNAs about mental stamina. One potential reason for this difference could be linked to the responses earlier in the questionnaire about frequency of Lámh use. SNAs outlined they use Lámh more frequently compared to the responses from teachers. If SNAs are using Lámh more often in school, they may feel the impact of requiring mental stamina more. SNAs typically spend more one to one time with the students they are assigned to which may be the Lámh user. This could be another

contributing factor to needing more mental stamina by SNAs, as they are involved in more communicative situations throughout the day that require ongoing use of signs and quickly access these signs.

Table 4

Psychological Capability (In order to sign more in school I would need to….)

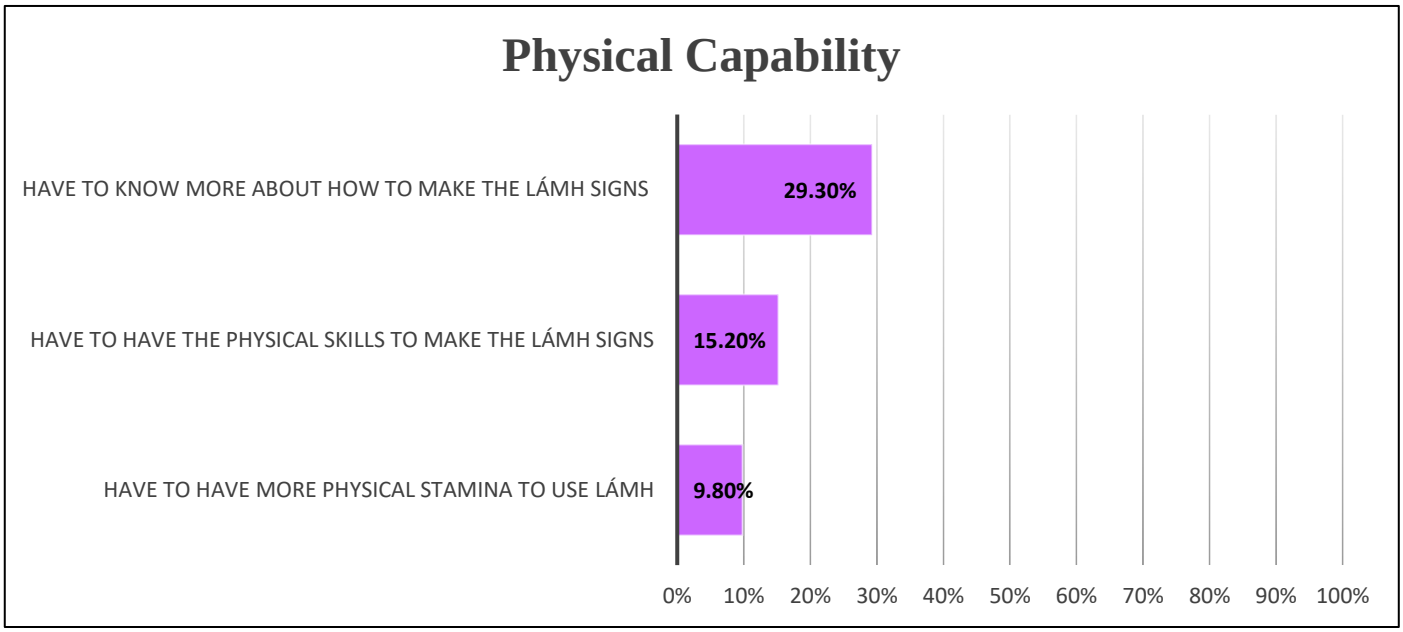
Category Code	**Teachers (n=55)**	**SNAs (n=37)**	**Total (n=92)**	***Examples of supporting statements provided***
Know more about why Lámh is important and the benefits Importance and benefits	58.2% (32)	67.6% (25)	62%	*I would have to have more knowledge of the benefits T40* *I would have to understand why Lámh is beneficial SNA34*
Know more about how to integrate Lámh in to daily activities in school Integrating Lámh	65% (36)	65% (24)	*65%*	*I am extremely lucky to be working with a teacher who works with Lámh and integrates it often when telling stories, singing songs and in the class Christmas play SNA1* *Yes, having ideas and structure to help integrate it would help me use it more maybe T30*

Know more about the range of signs available	54.5% (30)	64.9% (24)	*58.7%*	*I would need to know a wide range of signs to be capable of fully using Lámh SNA19* *I would have to know more about more school related vocabulary which would be of a huge benefit in the school environment for the child/children involved T24*
Know more about where to access Lámh signs	60% (33)	35.1% (13)	*50%*	*I found Lámh to be extremely beneficial for the student in my class, however the signs were not easily accessible to me, for example I had an EAL student in my class and I could quickly access resources in her home language online, whereas it was not always as simple for accessing Lámh resources T10* *Yes, I can forget the signs sometimes and it takes time to access them online, e.g. YouTube as I don't have a Lámh account T27*
Know more about the resources available to support use of Lámh	52.5% (29)	46% (17)	*50%*	*It would be brilliant if there was a dedicated school resources section on the Lámh website for educators to access T24*
Have to know about how to support Lámh users	45.4% (25)	35.1% (13)	*41.3%*	*I would have to agree with this. The child in my class can be quite reluctant to use Lámh even with my encouragement T24*

				Yes I think this would help me using it as I could see things from the users point of view SNA18
Have to know about how to support peers of a Lámh user	52.6% (29)	43.2% (16)	*49%*	*I would need practical day to day ways to encourage the pupil to sign throughout daily routine activities T4* *Any training refers to the Lámh user more than their peers and this is important to include when training school staff as peers are a big communication partner T41*
Have to have more mental stamina to use Lámh	14.5% (8)	29.7% (11)	*20.6%*	*This can be hard trying to remember every sign but it's worth it SNA1*
Have to have a supportive environment	54.5% (30)	67.6% (25)	*59.7%*	*Our school has a very supportive Lámh environment however Lámh is not part of the overall department of education school curriculum therefore it is up to the individual school to implement it. This means that a child may use Lámh in their own school but when they are in other environments e.g. extracurricular activities they may have no means to communicate with others SNA10* *I would like to see all staff, who are supporting a Lámh user, to get training, I find in mainstream schools that not enough staff have Lámh! SNA17*

Figure 9

Physical Capability Questionnaire Results **(***In order to sign more in school I would….)*



4.3.2 Physical Capability

There were three response options in the physical capability section of the questionnaire (listed in Figure 9).

4.3.2.1 In order to sign in school I would have to know more about how to make the Lámh signs. When asked what factors relating to capability would influence staffs use of Lámh in a mainstream school, participants did not report physical capability components as often as psychological capability. Just under 30% of participants reported they would need more knowledge of how to make the Lámh signs. Some supporting statements provided in the questionnaire included *"yes I think you need constant reminders of all the formations to make different signs"* T28 and *"It can take some practice but with consistent use it gets easier" SNA5.* This was discussed further by some participants in the focus group *"it can be stressful at times trying to remember all the hand actions"* SNA1_1 *"I know how to make enough signs to get her current needs met"* T1_2 *and "It is easier to remember how to do the basic*

instructional signs I think" T2_1. This finding is somewhat surprising given the recurring mentions of training needs throughout this study. Training would provide participants with the knowledge of how to make Lámh signs but the construct of physical capability did not include examples of training. Perhaps participants did not feel they needed training to physically know how to make the signs, and the idea of training to them related more so to broader aspects of Lámh use as outlined previously. The fact that fewer participants reported factors relating to physical capability as key to their signing in school, could also be due to the higher iconicity of KWS compared to full sign language, for example Lámh, which varies from ISL. One factor this could be attributed to may be the reduced psychomotor demands of using KWS as fewer words within a sentence are signed, thus requiring less physical stamina (Rombouts et al. 2020).

4.3.2.2 In order to sign in school I would have to have the physical skills to make the Lámh signs. A relatively low percentage of staff responding to the questionnaire reported needing to have the physical skills (15%) in order to feel capable of using Lámh. Some participants outlined why this might not be as relevant "*Some of the alphabet letters are tricky to sign but for the most part it is not difficult to sign words"* SNA1 and *"I find the letters difficult but all module one signs are accessible to most users"* T1. One SNA outlined what physical skills staff might require in order to sign *"I would have to have good coordination skills"* SNA34. Similar to the concept of physical stamina, this finding indicates that a change in physical skills in not the most necessary factor when considering elements of behaviour change for increased sign use in school.

4.3.2.3 In order to sign in school I would have to have more physical stamina to use Lámh. In terms of physical stamina, participants shared why they did not deem this relevant *"I wouldn't have thought this is relevant, it becomes part of your day"* SNA1 and "*This is not an issue, it is not a strenuous task by any means"* SNA18. Neither physical skills nor stamina were discussed by participants in the focus groups. The concept of motor dexterity

was highlighted by O'Leary et al. (under review) who reported that teachers were concerned that the Lámh users they worked with may struggle physically making the signs more than the teachers themselves. Potentially, staff might note difficulties in the area of motor coordination and physicality of the Lámh user, but felt themselves it was not an issue that would impact their own capability. KWS systems are simplified compared to full sign languages, where less emphasis is placed on finger spelling and hand positions are less complex (Frizelle & Lyons, 2022). Reduced demands on dexterity has lent KWS to require less physical stamina.

4.3.2.4 Differences in responses between teachers and SNAs relating to physical capability. In relation to physical capability, there was little difference in the responses between teachers and SNAs needing to know the steps involved in making different signs. However, there was some difference evident in the frequency of responses relating to physical skills and physical stamina. Twenty percent more SNAs than teachers outlined they would need to have the physical skills to use Lámh signs in school. Only 5% of teachers outlined needing physical stamina, compared to a slightly higher percentage of 16% SNAs. The components of physical capability were not discussed in the focus groups, which aligned with the lower rates of response in the questionnaire for this component. Interestingly, O'Leary et al. (under review) highlighted that teachers specifically outlined the motor dexterity required of children to sign correctly. While this was not related to the teachers physical skills themselves, perhaps the lower rate of responses from teachers in the current study relating to physical skills is due to their focus on the Lámh user themselves having more difficulty.

Table 5

Physical Capability (In order to sign more in school I would….)

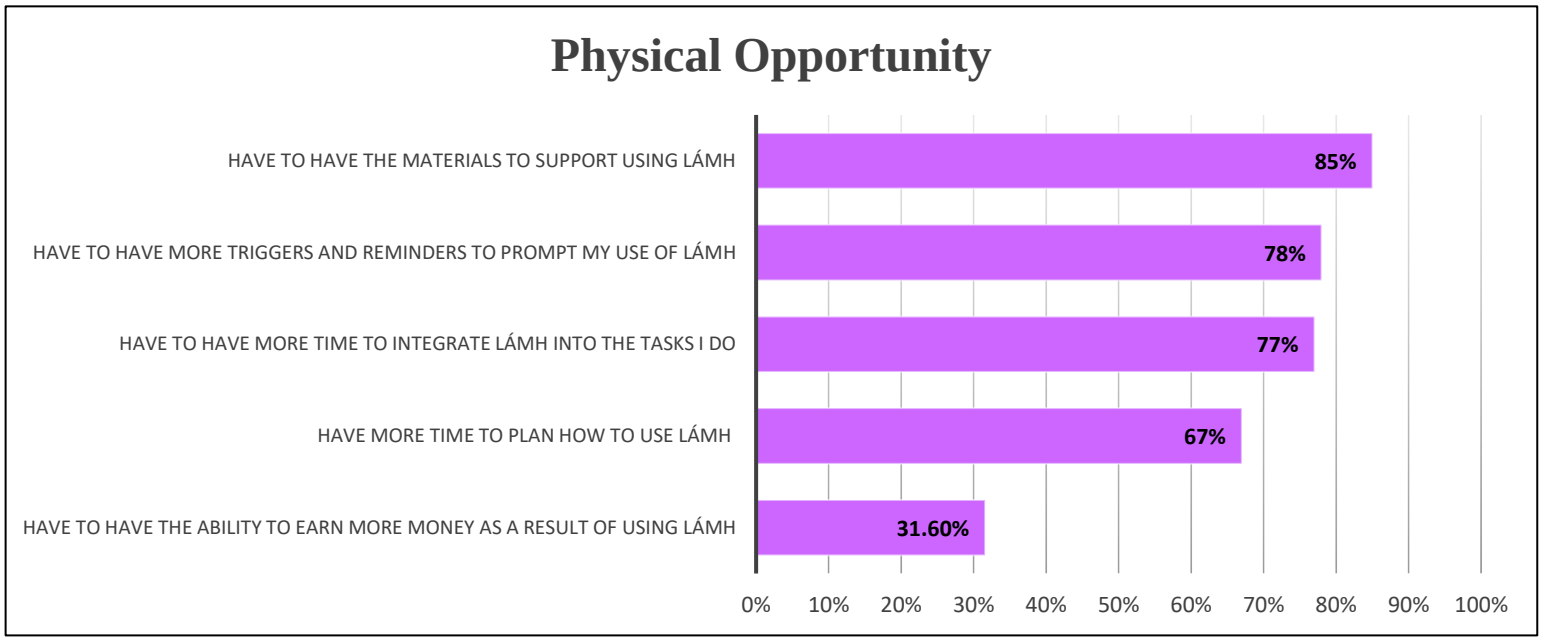
Category Code	**Teachers (n=55)**	**SNAs (n=37)**	**Total (n=92)**	***Examples of supporting statements provided***
Have to have the physical skills to make the Lámh signs	7.2% (4)	27% (11)	*15.2%*	*Some can be a little tricky but are all manageable with practice SNA5*
Have to have more physical stamina to use Lámh	5% (3)	16.2% (6)	*9.8%*	*When being able to communicate successfully it outweighs any stamina issues. It does takes?? practice SNA5* *Not physically tiring SNA7*
Have to have more knowledge of how to make the Lámh signs	31% (17)	27% (10)	*29.3%*	*Sometimes it can be difficult to follow for an unfamiliar word T5* *Yes this is important as you want to feel confident that you are making the sign correctly T16*

4.4 Opportunity

Fifty Five participants answered the question relating to the opportunity component of the COM-B model in the questionnaire which included two subcomponents, physical opportunity and social opportunity. Both physical and social opportunity factors were relevant to participants.

Figure 10

Physical Opportunity Questionnaire Results (In order to sign more in school I would….)



4.4.1 Physical Opportunity

There were five response options in the physical opportunity section of the questionnaire (listen in Figure 10).

4.4.1.1 In order to sign more in school I would have to have the materials to support using Lámh. As outlined in Figure 10 above, the most commonly selected component within physical opportunity was needing to have the necessary materials to support using Lámh. Eighty five percent of staff in the questionnaire felt this factor was relevant, with a supporting statement including *"The necessary material needs to be more readily available*

and free to encourage everyone to learn Lámh. It is pointless the teacher and SNA using Lámh if child's family are not due to lack of resources" SNA10. Participants in the focus group shared further insight into what materials they avail of that supports their physical opportunity to use Lámh. Some staff referred to videos as a useful material, "*the video that shows you exactly how to do it (sign) helps"* SNA1_2 and *"The video demos are better than just the pictures online"* T2_2. Others mentioned the handbooks *"The handbooks are good"* T1_1 and *"The module one materials are a good starting point"* T1_2. These findings are in keeping with those of Patel et al. (2022) where the COM-B model was used to investigate the impact of COVID-19 on digital practice for paediatric SLTs. While Patel et al. (2022) did not investigate KWS, the desire for more materials was highlighted by participants as influential on their behaviour. The provision of materials to support the implementation of Lámh is considered part of physical opportunity. However, one could also argue that having materials may also impact staff's psychological capability as materials could potentially facilitate an increase in peoples' knowledge of how to use Lámh. It can also be hypothesised that this in turn can lead to increased motivation. By having the materials necessary, staff have one less obstacle to overcome and perhaps may feel more motivated to develop plans to sign or have feelings of wanting to use Lámh.

4.4.1.2 In order to sign more in school I would have to have more triggers and reminders to prompt my use of Lámh. Seventy eight percent of staff in the questionnaire reported they would need triggers and prompts in order to use Lámh in the school environment. Participants provided supporting statements to explain what triggers or prompts may be supportive *"I would ask management to invest in Lámh posters for school building, internal and external"* T18, *"yes perhaps having some signs on a keychain visual or in posters in the school could help"* SNA18 and *"visuals of the Lámh signs used most often would be helpful to trigger me"* T28. Participants in the focus group shared further examples of what triggers or

prompts are currently in place to support their use of Lámh in the school environment *"We have lovely displays in the yard"* T1_2, *"Have reminders on the whiteboard of a sign"* T1_3 and *"Scattered visuals around the classroom"* T2_2. Further examples provided by participants highlighted the associated benefits of having triggers or prompts for the opportunity to use Lámh in school *"a visual trigger helps to remember signs especially when under time pressure"* SNA1_1 and *"posters also give visitors to the class prompts to use (Lámh)"* SNA2_2. Visual information can be presented in different forms, written language, symbols or pictures. It is more permanently accessible than verbal information and remains an externalised memory resource (Perkins, 2007). While visuals are proven to benefit children with disabilities in the classroom (Foster-Cohen & Mirfin-Veitch, 2017), findings in the current study outline the benefits that visuals or prompts can serve for staffs use of Lámh in mainstream schools. While staff might put these triggers in place for their own reminders, it is likely that the Lámh user, peers of the Lámh user or any visitors to the school may also reap the benefits of reminders across the school environment. Prompting and cues are effective methods of supporting goal-directed behaviour (Duckworth & Gross, 2020). Distinctive cues especially can help capture people's attention and direct them to engage in a desired behaviour. Findings in the current study outline the value teachers and SNAs place on the use of triggers or reminders to support the target behaviour in question, use of Lámh in school. To facilitate behaviour change, it will be important to embed prompts and reminders in the frequented locations in the school environment to support teachers and SNAs to sign.

4.4.1.3 In order to sign more in school I would have to have more time to integrate Lámh in to the tasks I do. Time was a highly reported factor by questionnaire participants with 77% reporting they would need time to integrate Lámh in the school environment. Some supporting statements related to having time to integrate Lámh include *"It is probably easier for me to integrate it during resource class time as it is protected 1 to 1 time"* T29 and *"As an*

SNA my day is less structured than a teacher so I think less time is given to dedicated Lámh use it is more fluid throughout the day" SNA19. This is similar to the findings by McDowell and Bornman (2022) where some staff identified time as a challenge they encountered when using KWS in special school. Discussions in the focus group revealed that time can often be a barrier when trying to integrate Lámh into daily activities in school. One SNA noted *"Time can be a barrier; the class can be so fast-paced"* SNA1_2. A teacher noted *"There's a time constraint for most mainstream class teachers, there is so much to get through"* T1_3. Research regarding implementation science relating to the classroom environment highlight similar findings relating to opportunity constructs. Day et al. (2019), investigated the effective implementation of primary school based healthy life style programmes, where one similar component acting as a barrier to implementation proved to be time constraints. A dense curriculum and competing demands proved challenging when implementing additional programmes or interventions, which was reflected in the current study also.

Time to both plan and implement Lámh is an important aspect to consider when looking at the successful use of Lámh in the school environment.

4.4.1.4 In order to sign more in school I would have to have more time to plan Lámh use. Sixty seven percent of staff in the questionnaire also noted the importance of needing time to plan Lámh use, *"I think this is especially important at the start when you have never used Lámh before. You need time to plan what signs you are going to use, practise them and introduce and teach them"* T4 and *"including it in lesson plans is a helpful reminder"* T28.. Similarly, participants in the focus group felt that time was a barrier when considering planning Lámh use and shared some ideas of how they might plan had they more time to do so *"I would include it in lesson and activity plans if I had the time"* T1_1, *"when I have time I pick out the key signs that are needed in an activity so yes this is beneficial as then I can model them correctly"*SNA1_4 and *"You would need the time to get those resources ready for each*

lesson" T1_4. As outlined also in section 4.4.1.3, time was often considered by participants as a barrier and this will be further discussed in section 4.6.

4.4.1.5 In order to sign more in school I would have to have the ability to earn more money as a result of using Lámh. While 31% of participants in the questionnaire selected the option of needing the ability to earn more money in order to use Lámh in school, the supporting statements related more to financial reimbursement for the cost of training or materials. Examples of such statements include *"I don't think this is applicable, maybe financial support for the trainings but it is just part of my day"* SNA18, *"l paid for my QQI level 5 myself and took time off at my own expense, CPD hours at least would have been nice"* SNA7 and *"I wouldn't agree with this but it would be encouraging if the school paid for the courses"* T1. One staff member also noted why this factor would not be relevant to them *"no I don't think this should be a factor, I use Lámh because it is my duty as a teacher to ensure all children in my class can communicate, regardless of what means they may use"* T30. Overall, the idea of financial incentives were seen as a bonus. The concept of financial gain is not central to behaviour change based on the findings in the current study. This finding is not consistent with the school-based implementation science literature in relation to delivery of healthy eating programmes by Day et al. (2019) for example, where funding was a recurring challenge in the access to certain programmes. While the current study relating to stakeholders personal opportunity, it is important to reflect on the future barriers that schools as a whole may also encounter when implementing new programmes or interventions, as outlined by Day et al. (2019).

4.1.1.6 Differences in responses between teachers and SNAs relating to physical opportunity. There was a difference in the response levels between teachers and SNAs relating to needing time to integrate Lámh. Only 60% of SNAs reported this compared to 88% of teachers. As previously outlined, teachers and SNAs are engaged in different roles in the

classroom. Typically, the SNA is responsible for 1-2 children in the class, whereas the teacher typically has approximately 30 students at any one given time. While similar responses were noted for needing time to plan Lámh use, the difference in responses for needing time to integrate Lámh could potentially be attributed to the demands on different staff members during the classroom activities. As the SNA is supporting the potential Lámh user more closely, perhaps it is easier to integrate signs more seamlessly by clarifying teacher instructions, interpreting lessons and assisting students with educational activities (Logan, 2006). A teacher may find it more challenging as they need to integrate signs into classroom based activities while simultaneously addressing the needs of the collective. This is likely to make it more difficult for teachers to slow down and incorporate key word signs in their communication, as well as allowing children's responses that can also incorporate signs.

There was also a difference noted between teachers and SNAs responses regarding needing triggers and reminders in order to use Lámh in school. While 65% of teachers reported this, 96% of SNAs reported it was relevant. Perhaps the difference here could be attributed to the different levels of planning that each role engages in. As teachers typically design lesson plans, maybe they are planning out the signs they need and do not feel that triggers or reminders are needed outside of this. SNAs on the other hand work more fluidly with the children they are assigned to and this often includes non-academic tasks such as personal care, movement breaks etc. Perhaps prompts and reminders are valued more by SNAs to ensure they are using signs across a range of activities both internal and external to the classroom. The SNA scheme also has a role in the successful inclusion of children with disabilities, so in recognition of their inclusive role, SNAs may value triggers or reminders to sign more, so that they can maximise inclusion in and beyond the classroom (Murphy et al., 2022).

Table 6

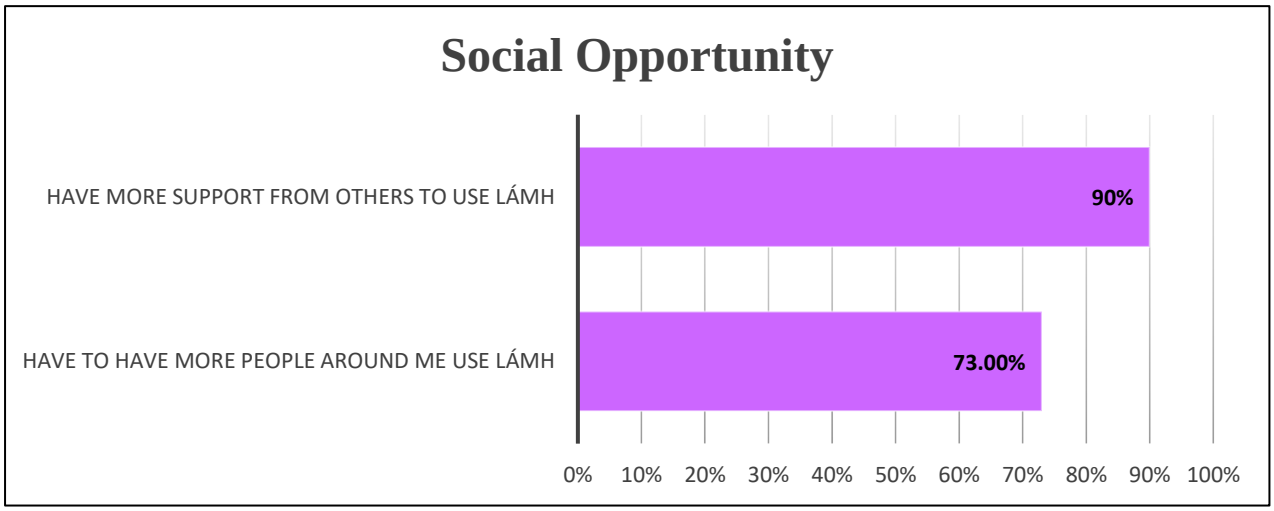
Physical Opportunity (In order to sign more in school I would….)

Category Code	Teachers (n=35)	SNAs (n=25)	Total (n=60)	Examples of rationale provided
Have to have more time to integrate Lámh in to the tasks I do	88.6% (31)	60% (15)	76.6%	*Part of our day naturally SNA2* *Yes, if I had more time to slow down and do it then could be easier to implement more often T38*
Have to have more time to plan Lámh use	65.7% (23)	68% (17)	*66.6%*	*I would need to ensure all lessons are tailored to include the child T19* *You need time to meet with all parties involved with the child SEN, class teacher, SNA to make a proper plan and know when to use your signs T16*
Have to have the materials to support using Lámh	82.9% (29)	88% (22)	*85%*	*I would do another Lámh course but online course would be great also that you could log in at your own pace and time SNA1* *This is a huge obstacle T8*

Have to have more triggers and reminders to prompt my use of Lámh	65.7% (23)	96% (24)	*78.3%*	*I would have posters displayed in all schools SNA2* *I would have to make sure my classroom is set up in such a way that enables all children to use Lámh throughout the day (use of classroom displays & noticeboards) T34*
Have to have the ability to earn more money as a result of using Lámh	34.3% (13)	28% (7)	*31.6%*	*That would be super but SNAs' salary is fixed SNA1* *Lámh courses are expensive so yes, I agree with this as I would continue in the study of Lámh if there was a monetary benefit at the end T5*

Figure 11

Social Opportunity Questionnaire Results (In order to sign more in school I would….)



4.4.2 Social Opportunity

There were two response options in the social opportunity section of the questionnaire (listed in Figure 11).

4.4.2.1 In order to sign more in school I would have to have more support from others to use Lámh. Ninety percent of participants in the questionnaire felt they would need to have more support from others to use Lámh. Some participants outlined who they would seek support from, including colleagues, *"I would need support from others because if the class teacher doesn't use the signs I am teaching the child then I am just teaching them in isolation"* T27 and *"Yes - colleagues should support me, especially teachers that will have the user in their class in following years"* SNA18. The findings are similar to Smidt et al. (2019) who investigated key word sign training. Smidt et al. (2019) reported that when staff attended KWS training with colleagues they found it beneficial, as there was someone to liaise with and feel supported by. Staff members in the focus group discussed who they would need support from highlighting colleagues, and parents of a Lámh user. Some examples include *"I would need*

supportive teachers and the principal to be involved" SNA1_1 *and "If you don't have support from home, you're fighting a losing battle"* T2_2. The support from an SLT was also mentioned by participants in a positive light, *"The SLT really supports me in the classroom"* T1_1, *"The SLTs are a fantastic resource" T1_2* and *"The SLT gives us resource packs with activities once a month"* SNA1_1. Similar findings were outlined by McDowell and Bornman (2022) where staff outlined the key collaborators in school as SLTs, colleagues, principals and parents. The support from others plays a vital role in creating social opportunities to use Lámh in the school environment. While support in school is a key component to create social opportunities, external support from a child's SLT provides staff with assistance and advice where needed. The role of parental support must also be considered. As highlighted in the current study, and by McDowell and Bornman (2022), parental buy in to the use of KWS is central to the implementation of signing in school. For KWS systems to be effective, all communication partners need to be engaged and willing to support the Lámh user, across all contexts and communication environments. To focus further on support provided by the SLT, findings by O'Leary et al. (under review) outline that teachers and SNAs note the benefit of external support from an SLT. This support acts as a facilitator to using Lámh in mainstream schools and the findings by O'Leary et al. (under review) mirror that of Byrne et al. (2019), highlighting the need for ongoing support and follow up post training. As outlined by Vlcek et al. (2020), stakeholder collaboration between teachers, parents and allied health professionals is a key component of successful inclusive education. One key finding by Vlcek et al. (2020) was the need for increased opportunities to collaborate when supporting autistic children in mainstream schools. Hypothetically, increased support from others may enhance collaboration between staff and thus increase use of sign in school. As a result, there is potential to build more inclusive environments across mainstream primary schools, where Lámh can be implemented

successfully and used by a range of communication partners and facilitate continued behaviour change.

4.4.2.2 In order to sign more in school I would have to have more people around me use Lámh. The need for others to use Lámh was also highly reported, with 73% of staff outlining this in the questionnaire. Many of the supporting statements provided by participants outlined how the use of Lámh by others would impact their social opportunities to sign, *"This would be in an ideal world but moving towards this is great"* SNA1, *"I would have to make sure other children & classmates are familiar with the use of Lámh, so that not all communication through Lámh is coming specifically from the teacher"* T34 and *"This would create an environment that welcomes Lámh"* T19. This was touched on briefly in the focus group where participants shared their views *"I love the idea of all children using it in school in an ideal world"* T1_4, *"Lámh should be used by all in schools regardless, it is such a good skill"* T1_1. Other staff members in the focus group shared examples of who uses Lámh in their schools, *"Our receptionist and caretaker even use some signs"* SNA2_1 and *"teachers, students and staff across the school use key signs"* T2_1. Similar findings were outlined by Carroll et al. (2021) where the use of Lámh by communication partners was explored. If we are to create a supportive environment with respect to Lámh, communication partners need to be willing to embrace alternative methods of communication such as Lámh. One important communication partner is the child's teacher and the need for consistent use was discussed. Changes such as a substitute teacher impacts consistency of communication if that teacher does not have the required knowledge of Lámh. The use of Lámh, or lack thereof by peers or extended family of a Lámh user was also outlined by Carroll and colleagues (2021). By not using Lámh, a child can face significant communication difficulties which in turn, can cause feelings of isolation and frustration. The findings presented by Carroll et al. (2021) can be compared to the findings in the current study relating to social opportunity. The construct of

social opportunity is closely linked to a wide circle of communication partners. The findings of the current study outline the importance of more people in the stakeholders environment using non-aided gesture systems as a potential enabler. Consistency with findings of preexisting implementation science literature relating to the classroom environment are evident. Gallagher et al. (2023) outline that leadership by principals was identified as an enabler to implementation of new initiatives in a school environment. If staff in schools do not have other colleagues and stakeholders using Lámh, the social opportunities are immediately hindered.

4.4.2.3 Differences in responses between teachers and SNAs relating to social opportunity. Overall, there was a similar difference in the levels of responses from teachers and SNAs for both subcomponents of social opportunity. Approximately 20% more SNAs felt they would need support from others or use of signs by others to use Lámh in school. Findings by O'Leary et al. (under review) outlined teachers and SNAs experiences of Lámh in mainstream school. O'Leary et al. (under review) highlighted that while both cohorts viewed support from others, specifically support from SLTs as a facilitator to using Lámh, 100% of teachers agreed. These findings are somewhat contrasting to the current study, and the difference could be due to the variations in experience and training levels of participants in both studies. Furthermore, Byrne et al. (2019) outlined findings relating the KWS use within the Irish disability context, including within special preschool and primary school settings. Byrne et al. (2019) noted that 84% of school staff felt supported to use Lámh. While the specific roles of school staff were not outlined, these findings echo the overall consensus from staff in the current study that support and use of Lámh by others is essential to engage in signing. The findings suggest that social opportunity requires consideration, therefore an emphasis to ensure SNAs experience the same level of support as their teacher counterparts may be an important component of effective behavior change for all stakeholders in this context.

Table 7

Social Opportunity (In order to sign more in school I would….)

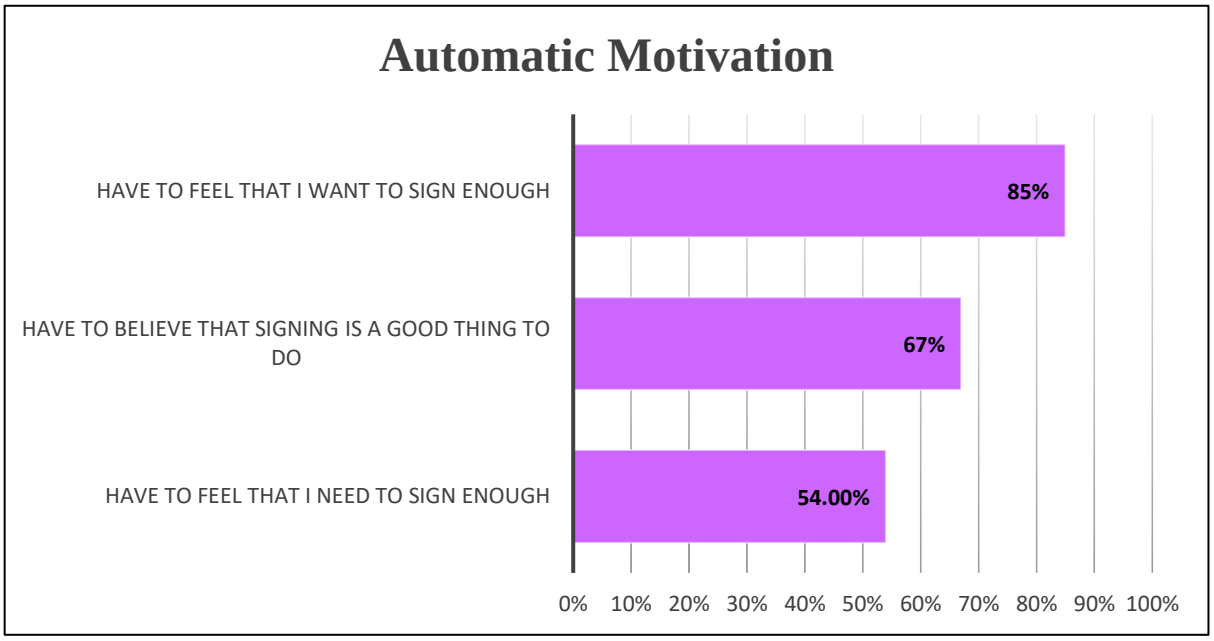
Category Code	**Teachers (n=35)**	**SNAs *(n=25)***	**Total (n=60)**	**Examples of rationale provided**
Have to have more support from others to use Lámh	82.9% (29)	100% (25)	*90%*	*Working as a team just makes everything easier and has better results as you are learning and planning together and able to review what is working and what is not working T16* *The whole school adopting Lámh would be very supportive T28*
Have to have more people around me use Lámh	62.8% (22)	88% (22)	*73.3%*	*We use Lámh at whole school assembly SNA2* *All of my class use Lámh but not many of the staff members. They know little bits and pieces but I feel like every teacher should be taught it T5*

4.5 Motivation

Thirty seven participants answered the question relating to the motivation component of the COM-B model in the questionnaire. Both automatic and reflexive motivation factors were relevant to participants.

Figure 12

Automatic Motivation Questionnaire Results (In order to sign more in school I would need to….)



4.5.1 Automatic Motivation

There were three response options in the automatic motivation section of the questionnaire (listed in Figure 12).

4.5.1.1 In order to sign more in school I would have to feel that I want to sign enough. In terms of automatic motivation, having to feel the desire to sign was the most selected response in the questionnaire, with 85% of participants choosing this. Staff felt that wanting to sign would be part of their motivation, with one teacher stating *"I would want to sign to prevent communication breakdown"* T38 and another *"yes of course you need to be motivated to use sign enough but seeing the Lámh user respond better is motivating in itself"*

T31. Other supporting statements included *"when you see the child respond and communicate easier it brings such satisfaction"* SNA18 and *"I get a sense of satisfaction when I see the children who are stuck being able to remember the word when I do the Lámh sign for it"* T5. These findings are similar to Carroll et al. (2021) where communication partners highlighted that willingness to use Lámh was a key theme when asked about their experiences using Lámh. Staff need to be willing to embrace alternative methods of communication such as Lámh. This can be directly linked to having the desire to sign. When willing and wanting to use sign, staff would feel more motivated. Participants in the focus group shared further views that the child's behaviour consequently impacts their desire to sign. Participant T2_1 noted *"Seeing them engage and communicate with you when you use it makes you want to continue"* while T1_3 agreed *"When the child feels understood his whole face lights up and that makes you want to do it because it is so worthwhile.* Similarly, SNA2_1 stated *"I want to do it because I know it can prevent feelings of isolation and frustration"*. One participant also shared their want to continue using Lámh, even when they no longer work with a Lámh user *"I just want to keep going with it, even if I don't have a child in my class next year*" T1_1. This is consistent with findings from other implementation science studies focused on the classroom environment, where Gallagher et al. (2023) outlined that motivation to improve personal was a precursor for practitioners to engage in reflexive processes.

4.5.1.2 In order to sign more in school I would have to believe that signing is a good thing to do. Sixty seven percent of staff in the questionnaire agreed that 'believing signing is a good thing to do' would influence their motivation. One staff member shared thoughts that *"until you work with a child with communication difficulties, it is hard to establish this (belief)"* SNA18. Further supporting statements include "*Knowing that it works and is researched and proven to work also motivates me"* T16, *"I believe that it's a child's right to be able to communicate and that we should do everything in our power to provide that for them whether*

it's PECS or Lámh or ISL" and *"I feel very strongly that we as teachers are not doing the child a favour or going above and beyond but simply providing a basic human right to speak and be heard"* T10. Discussions in the focus group confirmed that sometimes it is not until you experience using Lámh that you can be motivated by thinking it is a good thing to do *"Having used it, I can honestly say I feel it is such a good thing to do. The child lights up when they are understood and you can understand them"* SNA2_1, *"seeing them engage with their peers, being included and openly engaging with them motivates me to keep using it"* T2_3 and *"What motivates me to use Lámh is that I know this is the best system for the child and this makes me believe it is a good thing to use"* SNA2_3. This is similar to findings by Gallagher et al. (2023) relating to implementation science focused on the school environment, where over 90% of participants felt their beliefs about an intervention would be influential in their use of same. Findings by Cologan and Mevawalla (2018) can also be related, as participants shared their positive attitudes when asked about their use of KWS and potential benefits. Cologan and Mevawalla (2018) outlined that teachers would include KWS in their practice, being motivated by the benefits and believing it was a good thing to do. Although the educational setting was preschool level, Stringer et al. (2023) identified motivation as an enabling factor when investigating the partnership between early childhood educators and SLTs. Staff were motivated by the belief that collaborating would be a good thing to do. The current findings are similar to that of Stringer et al. (2023) and highlight the importance of motivating factors when considering behaviour change.

4.5.1.3 In order to sign more in school I would have to feel that I need to sign enough. Within the questionnaire, 54% of participants outlined that feeling that they need to use sign would serve as a motivating factor and examples of supporting statements included *"I would feel bad if I forgot or used the wrong sign"* T7, *"you need to care about the consequences and want to prevent communication breakdown"* T29 and *"Yes I do find that*

when you build a rapport with the child that uses Lámh you feel motivated by the fact it is your responsibility to immerse their methods of communication" SNA19. Similar views were noted in the discussions amongst focus group participants, *"I did not have a choice, it was the child's way of communicating and I had to learn it that was the motivation I just needed to use sign"* T2_1 *"You're kind of forced into it in one way, which sounds horrible but you just have to use it"* T1_3 and *"The child I was supporting used it so I felt I needed to do it as each child has an equal right to communication whatever format that may be"* SNA2_3. The development of intrinsic motivation was also outlined by O'Leary et al. (under review), where staff demonstrated increased levels of motivation in the fourth and final visit by the SLT, compared to the former visits. As outlined earlier, motivation is a precursor to behaviour change and participants in the current study shared the views that while it might not always be present initially, the concept of intrinsic motivation has the potential to grow overtime. This synopsizes that motivation factors are an important component of a maintained behavior change in this context.

4.5.1.4 Differences in responses between teachers and SNAs relating to automatic motivation. Within the component of automatic motivation, the only difference between the responses of teachers and SNAs was relating to having the desire to sign. Seventy one percent of SNAs reporting this compared to 92% of teachers. Potentially, more teachers currently lack the motivation to continuously implement Lámh as they might not work as closely with a Lámh user throughout the school day compared to the SNA. Interestingly, this difference is similar to findings by O'Leary et al. (under review) whereby SNAs developed intrinsic motivation by the third SLT visit to their school during the latter half of the academic year. Motivation is more personable than capability or opportunity, so the difference in responses is challenging to pinpoint. SNAs in this study reported using Lámh more frequently than teachers, which could contribute to the increased responses related to automatic motivation. The more people

use Lámh and see first-hand the potential benefits, the more likely they are to develop intrinsic motivation and the desire to keep signing and maintain their behaviour change (Stringer et al., 2023).

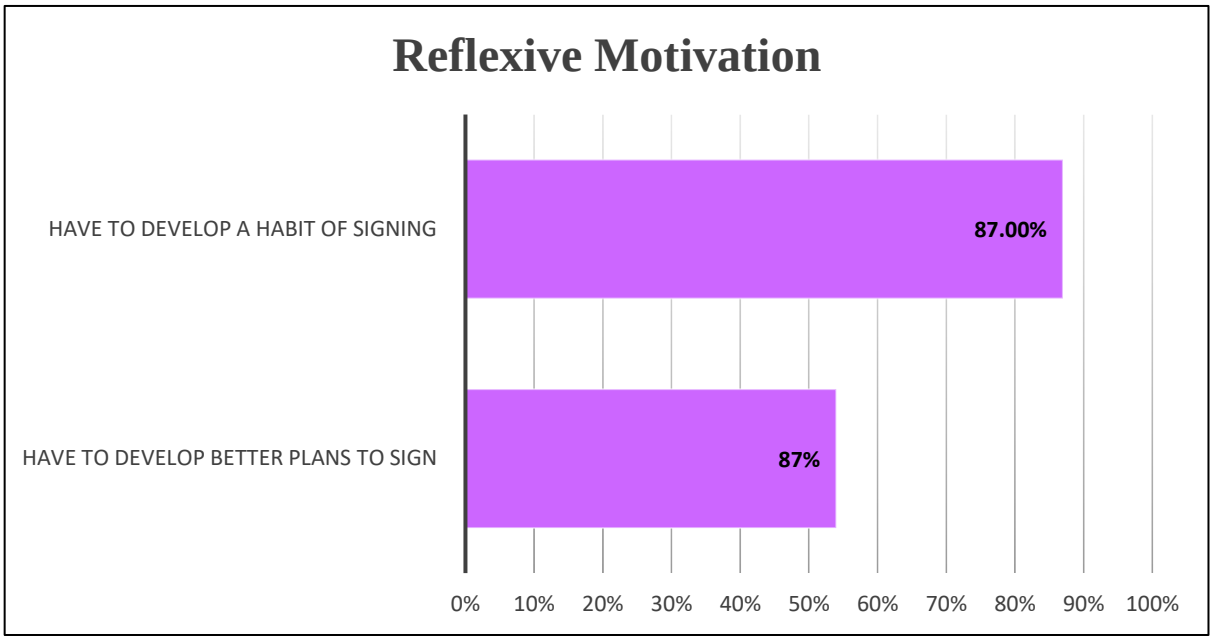
Table 8

Automatic Motivation (In order to sign more in school I would ….)

Category Code	**Teachers (n=25)**	**SNAs *(n=14)***	**Total (n=39)**	**Examples of rationale provided**
Have to feel that I want to sign	92% (23)	71.4% (10)	*84.6%*	*Seeing the child that uses Lámh communicate with more ease does help motivate me to sign T28* *When the child watches your hands when you're signing. Knowing he is understanding. When we can share a story or a laugh SNA5*
Have to feel that I need to sign	52% (13)	57.1% (8)	*53.8%*	*In moments of frustration or communication breakdown I see the impact forgetting signs can have T28* *yes caring about the negative outcomes of communication breakdown would motivate me to keep using it SNA26*
Have to believe that signing is a good thing to do	68% (17)	64.3% (9)	*66.6%*	*It is a good thing to do and easy to adapt so no reason why we should not all at least try T30* *I would have to see first-hand the benefits that using Lámh has* T34

Figure 13

Reflexive Motivation Questionnaire Results (In order to sign more in school I would….)



4.5.2 Reflexive Motivation

There were two response options in the reflexive motivation section of the questionnaire (listed in Figure 13).

4.5.2.1 In order to sign more in school I would have to develop a habit of signing. Finally, participants noted that developing the habit of using Lámh would be a factor in relation to reflexive motivation. Eighty seven percent of staff in the questionnaire outlined this and some staff described how they currently experience this, "*Yes, it is now a part of my day and I don't need to think about it as much so it is less work and easy to be motivated"* T30 and "*Yes - when it becomes second nature to use it, I guess it is more motivating as I see the benefits"* T29. Other staff members noted what it would take for this to become a motivating factor *"I would have to make Lámh part of my daily routine in the classroom"* T34 and *"It would be more motivating to be able to use it without thinking and not have to check the manuals"*

SNA10. This was reiterated in the focus groups where participants discussed how experience of using Lámh is closely linked to building the habit, *"It's funny how some things just stick with you and even not using Lámh currently anymore, you will still use some core signs"* T2_1, *"we just use it all day, in the yard, at lunchtime, in the Aistear room and now it is habit"* T1_3 and *"you would need to use it or you lose it"* T1_4. Findings by O'Leary et al. (under review) where Lámh use by communication partners was explored are comparable. Teachers and SNAs outlined the benefits of embedding signs into routines, and this can be linked to developing a habit. By incorporating Lámh signs into daily tasks in school e.g., social greetings or personal hygiene, perhaps it will become more familiar and not require as much thought and effort. Similarly, findings by McDowell and Bornman (2022) relating to sign use outlined that when investigating attitudes towards KWS, one of the main extrinsic challenges was difficulties making signing a habit. Moreover, Carroll et al. (2021) note that consistency of use is central to successful implementation of Lámh by all communication partners when such communication partners were interviewed about their Lámh use. By signing consistently, staff would build a habit of using Lámh and this may positively impact their motivation to sign. Findings by Aldabas (2021) further echo the value of consistency in the use of AAC in general when investigating the barriers and facilitators of AAC use in special education. Aldabas (2021) outlines that staff perceive the lack of consistent implementation of AAC as a potential barrier. It is important that supports are put in place to allow staff to incorporate signing in to their daily routines habitually.

4.5.2.2 In order to sign more in school I would have to develop better plans to sign.

Developing better plans to sign was not outlined by questionnaire participants as often when compared to developing a habit, nevertheless 54% highlighted they would need better plans in order to feel motivated to use Lámh. Some supporting statements provided insight which includes *"I would have to be more up to date on Lámh guidelines and practices within the*

classroom" T34*, "If I was in the habit of adding it to lesson plans it might help motivate me and follow through"* T28 and *"Yes treat it like other goals in the classroom and set targets"* SNA18.Developing better plans to sign may also be impacted by the provision of time. Had staff more time in their day, perhaps they would develop better plans to sign and as a result, be more motivated to continue using Lámh. This highlights that staff may require the physical opportunity of 'time' as discussed previously, to be able to engage more with potential factors of motivation like planning. While we cannot change the amount of time staff have, we can look at alternative ways of supporting teachers and SNAs to plan Lámh use and alleviate some of the time pressure that may be experienced. Lesson plans are a central part of the school day and core signs could be incorporated into this. Perhaps the relevant Lámh signs could be included in the lesson plans used by teachers for different themes, for example the weather, colours, feelings, and animals. If staff had resources that had the necessary Lámh content readily available, perhaps time would not be as much of an issue and staff would feel more motivated to sign and change their behavior.

4.5.1.3 Differences in responses between teachers and SNAs relating to reflexive motivation. All SNAs in this study felt that developing the habit of using sign would contribute to their motivation compared to 80% of teachers. As previously outlined, SNAs tend to work very closely with a Lámh user in the school environment across a variety of contexts. The proportion of SNAs currently working with a Lámh user was higher than that of teachers in this study and perhaps SNAs reflected on the idea of signing as a habit as it is more relevant in their current daily practice. Lower rates of responses from teachers relating to forming a habit to use signs can be compared with findings by Rombouts et al. (2017) where KWS use in special education schools were examined. Teachers in this study by Rombouts et al. (2017) noted that turning the use of signing into a habit is challenging. Perhaps this is one potential reason for the difference in responses between teachers and SNAs in this study. Teachers may

find building this habit more challenging and demanding than SNAs. It is important to note that the potential reasoning behind the differences in certain response rates of teacher and SNAs is subjective, and the researcher can only speculate on what these differences may be causative of.

Table 9

Reflexive Motivation (In order to sign more in school I would….)

Category Code	**Teachers (n=25)**	**SNAs *(n=14)***	**Total (n=39)**	**Examples of rationale provided**
Have to develop better plans to sign	53% (13)	57.1% (8)	*53.8%*	*I have found it more motivating to pre select my signs and practice them T16* *Planning is helpful SNA20*
Have to develop a habit of signing	80% (20)	100% (14)	*87.2%*	*I'm motivated by the habit of using it all these years SNA19* *It becomes habit when you are using it daily in school SNA18*

4.6 Barriers

Some comments and discussions related to the potential barriers staff face when using Lámh in the school environment. Participants across all four focus groups referred to the range of signs as a barrier when discussing their use of Lámh. Participants noted that they do not know a sufficient number of Lámh signs for school related vocabulary. SNA1_1 noted *"I struggle with more specific academic signs in subjects"* while T2_1 said *"I would need more signs to get me through the school day".* Some participants discussed the specific areas they do not have Lámh signs for: *"I also find some subjects like geography, history or sciences I wouldn't have enough signs to teach those subjects using Lámh"* T1_4 and *"We can use Lámh for Irish but when it comes to maths were more stuck"* T1_3. Staff's knowledge of the range of signs available is perceived as a barrier in this instance as they do not possess sufficient knowledge to fully embrace Lámh in the school environment. Potentially, this could be a consequential impact of training levels demonstrated by participants in this study. The full range of 586 signs is not available to staff members who complete a more introductory course such as Module One compared to those that complete the Add On module or the QQI Level 5 course. Without training at a higher level, staff do not have access to the full range of Lámh signs. One could also link this to the opportunity component within the COM-B model. Without the opportunity for example to complete this training, staffs' knowledge will be impeded.

Another barrier mentioned by some participants included accessing Lámh signs. One participant noted *"To be honest, I have tried googling signs and they don't show up"* T2_1 and continued to share that *"if you google an ISL sign it comes straight up, but this is not the case for Lámh"* T2_1. Findings by Glacken et al. (2019) highlight that parents appreciate the accessibility of Lámh as a way to support their child's communication as it does not rely on any external devices. It is important to reflect on this when discussing access to signs as a

barrier perceived by school staff. While a KWS system such as Lámh is an unaided form of AAC and relies on no external devices, signs need to be easily accessible to all communication partners. Without the knowledge of how to do a sign, there is a limit imposed on staffs' capability to use sign in the school environment, automatically hindering a child's support.

In this study, a potential obstacle to the uptake of non-aided gesture systems related to training. This is consistent with other implementation science studies focused on the classroom environment including research by Day et al. (2019), where the lack of training and technical support was a perceived factor hindering implementation of healthy lifestyle programmes in schools. The obstacle identified in this study that is paucity of training includes a number of aspects. Firstly, participants felt that the 100 signs taught in Module One, which was the most commonly availed of training by staff, did not suffice to meet the needs of those working in a mainstream school environment. T2_2 outlined *"The Module One course doesn't cover enough for school"* and T2_3 stated "*I didn't get enough from Module One either, I had to still go look up specific signs such as colours, actions and letters".* Participant T1_2 noted that sometimes Irish Sign Language is used when the Lámh sign is not available *"I find I dip into some ISL if there isn't a Lámh sign".* This supports findings by Frizelle and Lyons (2022) as discussed, where the Module One training does not sufficiently meet the needs of staff working in a school environment. The findings of O'Leary et al. (under review) also outline that Module One provides staff with insufficient preparation to use Lámh. Knowing how to make the signs is only one aspect, learning how to create communication opportunities is also important. Furthermore, O'Leary and colleagues (under review) outlined the challenge that teachers face when using Lámh in light of the absence of a Pedagogical Framework to teach Lámh. This potentially can negatively impact the consistent use of sign and establishment of a coherent signing environment.

Participants also felt that training can be difficult to access, a common obstacle discussed in other school based implementation science research (Day et al., 2019). Some insight from staff includes *"the courses are great but it is hard to secure a place on these sometimes"* SNA2_3 and *"it would be great if there was more training available for free"* SNA2_2. The financial burden of training was also discussed by participants who shared *"the courses can be pricey"* SNA2_3 and *"the courses and materials can be expensive"* T1_2, which is linked to physical opportunity also. To build an inclusive environment in mainstream schools, KWS systems such as Lámh need to be implemented. Findings by McDowell and Bornman (2022) support the point that lack of trained staff and lack of access or funding for training serves as a barrier for use of KWS in school. The provision of appropriate training for staff would be influential in many ways, one of which would be to increase staff's levels of knowledge and therefore, potentially impacting their psychological capability. This was echoed in findings by Byrne et al. (2019), where staff supporting Lámh users reported they often did not access formal training, rather they acquired signs from colleagues. Training is perceived as a barrier by staff, and this needs to be addressed in order to fully support staff's capability to use Lámh in school. As part of the clinical implications of their findings, Glacken et al. (2019) also outline that educationalists and school staff should be facilitated to receive training to support the implementation of Lámh appropriately in the school environment. The need for adequate, appropriate and ongoing training is evident in research relating to KWS. This will continue to remain a barrier and impact on staff's opportunity to sign unless the appropriate provisions are put in place for mainstream staff working with Lámh users. Those with training have different perceptions of barriers and facilitators compared to those without training (Aldabas, 2021; Radici et al. 2019).Whether it is accessing training or the content within available training, staff that do not engage in the appropriate training are likely to perceive barriers to have negative consequences that impact on their social and physical

opportunity to use sign. It is important to address such barriers when investigating the most appropriate intervention in future research. Without proper expertise, staff also might not avail of facilitators to their full advantage, again impacting on implementation of Lámh in school. This can also be linked to staffs attitudes, in the absence of training staff may not approach the use of Lámh appropriately and be fully immersed in the process. The importance of training extends beyond the acquisition of knowledge of signs but also feeds into how to create a successful signing environment and encourage communication partner's involvement. This is how people gain support from others and feel motivated to use signs and have the attitude required to embrace this unaided form of AAC.

4.7 Summary

The findings of this study suggest that while there is a general positive attitude to the use of Lámh in mainstream primary school, there are numerous key factors that will be central to behaviour change relating to non-aided gesture systems by teachers and SNAs. Therefore communication partner training for staff to be well equipped to use Lámh may be an important component of an effective behaviour change in this context. This extends beyond just knowing the signs, but relates to having knowledge of how to integrate signs in to the daily activities within the school setting and gain a deeper understanding of the importance and benefits of Lámh. A school-specific training program for teachers and SNAs may be a crucial element of an effective behavior change in this situation, as the findings imply that staff members would require support to be able to incorporate signs, facilitate communication, and support peers inside the classroom to promote behaviour change. Furthermore, the findings of the current study indicate that enhanced psychological capability, in addition to a supportive environment to sign in, may facilitate behaviour change. Social and physical opportunities will also be central to enabling behaviour change. Social opportunity in the form of support from others and use of signs by others will be invaluable to staff, as outlined in the findings of the research.

In addition, physical opportunity is relevant as staff need the necessary materials to support signing. While time constraints were discussed, it is important to consider innovative methods to efficiently make use of teachers and SNAs time. Perhaps resources and lesson plans can be designed to include relevant Lámh signs and suggestions of how to incorporate these into the classroom could be provided. This could be incorporated as part of a school specific training programme as outlined above. Finally, the findings highlight that to trigger any prospect of behaviour change, the desire to sign and the belief that Lámh is a good thing to do is required intrinsically by staff. The habit of using Lámh and creating plans to use Lámh is desirable to increase automatic motivation. The findings indicate that the features found within the COM-B model's components may be crucial elements that guide the creation of pertinent materials and a school-based Lámh teaching program.This in turn may facilitate increased effective behaviour change by teachers and SNAs in a mainstream school environment.

Chapter 5 General Discussion

5.1 Clinical Implications

The findings of the current study have implications for both Lámh users and all stakeholders that support them in attending mainstream primary school. This includes teachers, SNAs and school principals, but also the wider network of communicative partners including families and SLTs. Children with disabilities in Ireland are entitled to access education in a mainstream environment, as per the EPSEN Act (2004). There has been an increase in the number of children with disabilities attending mainstream education in Ireland over the last decade (Leonard & Smyth, 2022). With this comes the responsibility of schools to ensure that all children are able to communicate effectively, using whatever means of communication that may be. Children that use Lámh are no exception. The current study highlights what components within the COM-B model influence teachers and SNAs to use Lámh in a mainstream primary school environment. To enable inclusive education for people with speech language and communication needs, proficiency in the use of Lámh may be an important component. To do this, staff may benefit from having: knowledge of the importance and benefits of Lámh, how to support a Lámh user and their peers, supportive environment, materials and resources and feel supported or be motivated to sign. The key findings of this study also suggest that there are numerous barriers impacting teachers' and SNAs' use of Lámh, including training, time, resources and materials. These factors may be important components to be addressed to facilitate and maintain long term behaviour change.

An additional implication of the current study is related to the provision of Lámh training for staff and the wider school community. As outlined, the number of Lámh users enrolled in mainstream education is ever increasing. All communication partners and stakeholders may benefit from access to Lámh training to ensure effective communication and access to the curriculum. While a specific school based training would be beneficial to support this, Module One continues to be the only funded Lámh training. All those a child interacts

with in school need appropriate access to training and resources. This includes teachers and SNAs, but also peers, principals and wider school support staff. The current study outlined the desire from staff to access further training in order to help them use signs. Perhaps the provision of such training would be a contributing factor to the behaviour change process.

5.2 Strengths and Limitations

The current study is an important exploration of the potential components impacting teachers and SNAs use of Lámh in the mainstream school environment, based on the theoretical framework of the COM-B model. However, considerations of the methodological strengths and limitations of the study design must also be raised. The participatory research approach was adopted for this study and was a strength of the study design (Wilkinson & Wilkinson, 2018). The involvement of staff that use Lámh or have done in the past ensured that findings could be generated to contribute to effective change. Another strength of this study includes the use of inter-coder reliability to enhance the rigour of data analysis and decrease the risk of inconsistency (Tuval-Mashiach, 2017). While the COM-B theoretical framework provided the researcher with a structured coding system, it was important to reduce the risk of bias and subjective perceptions by having two coders. Such processes enabled another researcher to interrogate the work and ensure reliability.

A limitation of this study includes the large cohort of questionnaires that were not fully complete. Furthermore, there were inconsistencies across the questions as more participants answered the questions relating to capability compared to motivation for example. This resulted in a smaller sample size than intended. While the questionnaire was not demanding of much time, perhaps the increased complexity of questions as the questionnaire progressed contributed to incomplete responses. Perhaps the use of semi-structured interviews would have led to a more coherent data set. The relatively small data set is a limitation of the current study but nevertheless, the findings still contribute to the limited

research in this area. Ideally a bigger sample size would provide more reliability for the probabilistic sampling strategy adopted.

In addition, during the process of purposive sampling, practitioners from all school years were sought to participate in the study. The sample was more reflective of practitioners that worked with children in the younger class groups in primary school. The lack of staff representative of the later school years serves as a limitation in this research.

Finally, there were a number of supportive prompts embedded into the open ended questions in the online questionnaire. The phrasing of these questions may potentially have influenced the answers participants provided. For example, the multiple-choice option *"I would have to know more about how to integrate Lámh in to daily activities throughout the school day"* included the prompt *"e.g. how I can use Lámh signs during circle time".* While this is not a limitation as it aimed to give participants examples of what the question could refer to it is important to acknowledge in terms of transparency that this may have been interpreted as leading, thus influencing answers. However, the diverse range of responses received confirms that participants shared many of their own ideas, therefore the prompts are not felt to have impacted the results significantly.

5.3 Future Research

There are several areas that warrant further research based on the results and limitations of this study. Firstly, the identified COM-B components could contribute to the design of a behaviour change intervention targeting Lámh use in mainstream primary schools (Michie et al., 2014). Frizelle and Lyons (2022) have outlined a core school-based vocabulary list which could also contribute to the design of such intervention. By combining this vocabulary list by Frizelle and Lyons (2022) and utilising what was outlined by participants in this current study to help them sign, there is potential to develop a specific training programme which staff in mainstream education could access. The development of a school

based Lámh training course would have both social and academic benefits for all Lámh users in mainstream primary school. This could be developed in conjunction with the Lámh Development Office and the NCSE.

Secondly, similar studies could be carried out targeting different settings such as preschool. The inclusion of other communication partners as participants, for example principals, family members, and disability service staff would prove beneficial to gather insights from numerous stakeholders. Thirdly, an in-depth interview method could supplement the findings of this study. This would reduce the risk of incomplete responses and allow for the examination of all questions addressing the three core components of the COM-B model. Perhaps these in-depth interviews could also be completed as a follow up post the development of a school based training programme and resources. The COM-B model could also be applied to a communication partner training intervention, in conjunction with the use of AAC perhaps and not exclusively KWS.

5.4 Conclusion

The practice of changing people's behaviour is a complex task. This study outlines what components may be influential for teachers and SNAs to use non aided gesture systems in the school environment and facilitate effective behaviour change. A paucity of research is evident in this area. Specifically, this study contributes to the limited but growing literature relating to use of Lámh in Ireland. The application of the COM-B model provided a structure to examine existing behaviour of teachers and SNAs use of Lámh. Significantly, this research suggests what the communication partners need for successful use of signs. The findings show that many factors across each component of the COM-B model facilitate staffs' use of sign and outlines the barriers that exist when implementing Lámh in a school environment. It is evident that the successful implementation of Lámh in school relies on the capability and motivation of stakeholders such as teachers and SNAs, and what opportunities are available to them. As

discussed above, this study has potential implications for the development of future interventions to address school specific training and resources, for the use of Lámh in school. This research is certainly a stepping stone in the design of such behaviour change interventions, specifically in the field of KWS within the mainstream school environment.

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Appendix A. Ethical Approval

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Michaela Sheehan <118352463@umail.ucc.ie>

Log 2022-198 Approved

Ethics Committee, Social Research <srec@ucc.ie> Thu, Dec 1, 2022 at 11:05 AM
To: Michaela Sheehan <118352463@umail.ucc.ie>

Dear Michaela

The Social Research and Ethics Committee has now approved your application Log 2022-198 entitled "Using Lámh signs in mainstream primary schools: An application of the COM-B model."

The committee wishes you every success with your research.

All the best

Liz

My work day may look different than your work day. Please do not feel obligated to respond out of your normal working hours.

Liz Hales | Coordinator, Social Research Ethics Committee, University College Cork | srec@ucc.ie

Website: https://www.ucc.ie/en/research/support/ethics/socialresearch/

Independent Thinking, Shared Ambition: UCC Strategic Plan 2017-2022

Watch University College Cork: River of Life

Appendix B. Information Sheet

UCC
Coláiste na hOllscoile Corcaigh
University College Cork, Ireland

INFORMATION SHEET

Using Lámh signs in mainstream primary schools: An application of the COM-B model

This document explains the purpose of the project and what would be involved for you as a participant. This research is being carried out as part of a research Masters in University College Cork. This study has received ethical approval from the Social Research Ethics Committee of University College Cork.

Why am I being given this information sheet?



You have been given this information sheet as you are a teacher or SNA that (a) currently works with a child who uses key word singing in school or (b) has previously worked with a child who uses KWS in school. Please note, you may be asked to provide information about your previous training in Lámh but you can still partake in this study regardless of the level of training you have received.

What is the project about?

The purpose of this project is to examine what factors influence teacher and SNAs use of key word signing in the school environment when working with children that use KWS to augment their communication. This may include children with intellectual disability. Many children with speech, language or communication needs use KWS systems such as Lámh, to facilitate communication in the home and school environments. Lámh is the key word signing system used in Ireland. This study aims to examine what factors play a role in the use of Lámh by teachers and SNAs in a mainstream school environment, applying the COM-B model to examine capability, motivation and opportunity and how these factors influence one's behaviour.

What is involved if I partcipate?

- Should you decide to participate, you will be invited to complete a questionnaire, which will take approximately 15 minutes. In this questionnaire, you will be asked to reflect on factors that play a role in your use of Lámh in the school environment. This can be completed online.

- There will also be the opportunity for you to attend a focus group at a later stage, to engage in further discussion with the primary researcher about the factors that influence use of KWS in the school environment. This focus group will be in person and will take no longer than one hour.

We do not anticipate any negative outcomes from participating in this study. Participation in this study is completely voluntary. There is no obligation to participate. In the event you change your mind after participation, you may withdraw your data from inclusion for analysis within one week of your participation by email.

What will happen my data?

Confidentiality and anonymity will be maintained at all times by the researcher, who will make your information available only to the supervisors. All data will be turned into electronic format at the end of the project and saved on the supervisor's computer which is an encrypted and password protected work laptop. The entire set of data will be backed up on UCC-supplied OneDrive for Business through UCC Office 365. The data will be stored for at least 10 years, as required by the University. The data you provide will contribute to the dissertation of the researchers and may be disseminated through research publications and/or conference presentations, and no identifying information will be included in any of these documents. This data will also be available as per Open Science regulations.

Who can I contact for further information?

If you have any queries about this research, you can contact us at 118352463@umail.ucc.ie (Michaela Sheehan, Masters student), p.frizelle@ucc.ie (Dr. Pauline Frizelle, Research Supervisor) or c.otoole@ucc.ie (Dr. Ciara O'Toole, Research Supervisor).

Thank you for your time and consideration.

Appendix C. Informational Video



Appendix D. Questionnaire Consent Form

Project title: Using Lámh signs in mainstream primary schools: An application of the COM-B model

Consent Form

By clicking the button below, you acknowledge:

The purpose and nature of this study has been explained to me in writing.

I am participating voluntarily.

I understand that I can withdraw from this study up to the point of data submission.

I understand that my data will contribute to the dissertation of the student investigator and may be disseminated through research publications and/or conference presentations, and no identifying information will be included in any of these documents. I understand that the data will be stored on a UCC-supplied One Drive. I understand that my anonymised/ pseudonymized data will be available on the open science framework (OSF) for potential future analysis.

I agree to participate in this questionnaire.

- ○ I consent (1)
- ○ I do not consent, I do not wish to participate (2)

Appendix E. Questionnaire

Q1 Please select your occupation?

- ○ Teacher (1)
- ○ Special Needs Assistant (SNA) (2)
- ○ Other (3)

Q2 Where do you work?
Please note - this questionnaire is for staff of mainstream schools. Please click the following link if you work in a special school Special School Questionnaire

- ○ Mainstream primary school (1)
- ○ Special primary school (2)
- ○ Other (3)

Q3 Do you currently have a child who uses Lámh in your class or have you ever worked with a child that uses Lámh?

- ☐ Yes, currently (1)
- ☐ Yes, previously (2)
- ☐ No (3)

Q4 What class group do you currently work with?

- [ ] Junior Infants (1)
- [ ] Senior Infants (2)
- [ ] 1st Class (3)
- [ ] 2nd Class (4)
- [ ] 3rd Class (5)
- [ ] 4th Class (6)
- [ ] 5th Class (7)
- [ ] 6th Class (8)
- [ ] Resource Class (9)

Q5 Have you completed Lámh training?

- [ ] Little Lámh (1)
- [ ] Lámh Module One (2)
- [ ] Family Lámh (3)
- [ ] Family Lámh Part 2 (4)
- [ ] Family Trainer Programme (5)
- [ ] Modue One Add-on Workshop for Communication Partners of Children Lámh (6)
- [ ] Lámh QQI Level Five Total Communication (7)
- [ ] Lámh Tutor Training (8)
- [ ] Informal training from a Speech and Language Therapist (9)
- [ ] I have not completed training (10)

Q6 Where do you use Lámh in the school environment?

- [ ] Classroom (1)
- [ ] School yard (2)
- [ ] PE hall (3)
- [ ] Lunch room (4)
- [ ] Other (please specify) (5)

_____

Q7 For what activities do you use Lámh most?

- ☐ Story time (1)
- ☐ Circle time (2)
- ☐ Maths (3)
- ☐ Literacy (4)
- ☐ Lunchtime (5)
- ☐ Yard time (6)
- ☐ Music (7)
- ☐ PE (8)
- ☐ Games (9)
- ☐ Other (please specify) (10) _____

Q8 How often do you use Lámh in the school setting?

where 1=never and 10=always

1 2 3 4 5 6 6 7 8 9 10

How often do you use Lámh in the school setting? ()	

Q9 **Capability**

Which of these factors would be important to support your use of Lámh in the school setting? (choose as many options as apply)

In each case, use the text box provided to say why you think it might be important for you.

Finish the phrase, 'I would have to...'

☐ Know more about why Lámh is important e.g. the benefits of using Lámh with children with communication dificulties (please explain below) (1)
_____

☐ Know more about how to integrate Lámh in to daily actvities throughout the school day e.g. how I can use Lámh signs during circle time (please explain below) (2)
_____

☐ Know more about the range of Lámh signs available e.g. the signs for different school related vocabulary (please explain below) (3)
_____

☐ Know more about where to access Lámh signs e.g. what book, videos or online resources I can use to access Lámh (please explain below) (4)
_____

☐ Know more about resources available to support the use of Lámh in schools e.g. where to find appropriate books/courses to support my use of Lámh (please explain below) (5) _____

☐ Know more about how to encourage the Lámh user to use Lámh to communicate throughout the day e.g. create my teaching and learning activities in a way that the Lámh

user can response and participate using Lámh (please explain below) (6)
_____

☐ Know more about how to encourage peers to use Lámh, when communicating with a Lámh user e.g. how to support other children to use Lámh when communicating with the Lámh user (please explain below) (7)
_____

☐ Know more about how to make the Lámh signs e.g. the steps and hand actions to complete Lámh signs (please explain below) (8)
_____

☐ Have the physical skills to make the Lámh signs e.g. be able to manipulate my hand movements in to the shape of the sign, co-ordination skills (please explain below) (9)
_____

☐ Have more physical stamina to use Lámh in school e.g. have the physical strength required to keep using Lámh throughout the school day (please explain below) (10)
_____

☐ Have more mental stamina to use Lámh in school e.g. have capacity to maintain the mental effort required to keep using Lámh throughout the day (please explain below) (11) _____

☐ Have a supportive environment to overcome obstacles e.g. a greater support system to navigate obstacles to using Lámh in the school environment (please explain below) (12)
_____

☐ Other (please specify): (13)
_____

Q10 **Opportunity**

Which of these factors would encourage you to use Lámh in the school setting
(choose as many options as apply).
In each case, use the text box provided to say why you think it might be important for you.
Finish the phrase 'I would have to...'

☐ Have more time to integrate Lámh into the tasks I do as a teacher e.g. create dedicated time during the day (please explain below) (1)
_____

☐ Have more time to think about how to ensure the Lámh user can respond/engage in class through the use of sign e.g. time to include Lámh in lesson and activity plans (please explain below) (2) _____

☐ Have the necessary materials to support: teaching Lámh / childrens continued use of Lámh / my use of Lámh e.g. access to teaching supports and personal support for using Lámh in school (please explain below) (3)
_____

☐ Have more support from others to use Lámh e.g. support from colleagues to use Lámh (please explain below) (4) _____

☐ Have more people around me using Lámh e.g.all children and staff in class using Lámh (please explain below) (5)
_____

☐ Have more triggers to prompt my use of Lámh e.g. visuals to serve as a reminder for my use of Lámh (please explain below) (6)
_____

☐ Have the ability to earn more money as a result of using Lámh e.g. a higher salary if I use Lámh (please explain below) (7)
_____

☐ Other (please specify) (8)
_____

Q11 **Motivation**

Which of these factors would encourage you to use Lámh in the school setting (choose as many options as apply).

In each case, use the text box provided to say why you think it might be important for you.

Finish the phrase 'I would have to...'

☐ Feel that I want to sign enough e.g. get a sense of satisfaction or pleasure from it (please explain below) (1) _____

☐ Feel that I need to sign enough e.g. care more about the negative consequences of not doing it (please explain below) (2)
_____

☐ Believe that signing would be a good thing to do e.g. have a stronger sense that I should do it (please explain below) (3)
_____

☐ Develop better plans for signing e.g. have clear/better developed plans for achieving it (please explain below) (4) _____

☐ Develop a habit of doing it e.g. get into a pattern of doing it without having to think about it (please explain below) (5)
_____

Q12 Is there anything additional that would support your use of Lámh?

_____

Q22 We thank you for your time spent taking this survey. Your response has been recorded.

If you would be willing to participate in a focus group online to discuss the use of Lámh in mainstream schools, please contact 118352463@umail.ucc.ie

Appendix F. Focus Group Consent Form

Project title: Using Lámh signs in mainstream primary schools: An application of the COM-B model

Focus Group Consent Form

By clicking the button below, you acknowledge:

The purpose and nature of this study has been explained to me in writing.

I am participating voluntarily.

I understand that I can withdraw my data from inclusion for analysis within one week of my participation by email, without repercussions.

I understand how my data will be handled and stored. I also understand that my data will contribute to the dissertation of the student investigator and may be disseminated through research publications and/or conference presentations, and no identifying information will be included in any of these documents. I understand that the data will be stored on a UCC-supplied One Drive. I understand that my anonymised/ pseudonymized data will be available on the open science framework (OSF) for potential future analysis. I understand that my contact details will be destroyed upon completion of the project.

I agree to maintain confidentiality of the identity of fellow participants in the group.

I agree to participate in the focus group session for this project.

- ○ I consent (1)
- ○ I do not consent, I do not wish to participate (2)

Appendix G. Focus Group Question List

Capability

- How do you feel capable to support and encourage Lámh users use of sign?
- Discuss your previous Lámh training (if any) and the impact of this on your use of Lámh in school.
- What activities would you find easier/more difficult to integrate Lámh in?
- Do you think Lámh is important to use in the school environment? If yes, why?
- Do you know how to make sufficient Lámh signs to support communication in different aspects of school?
- Would you include Lámh in your lesson or activity plans? If yes, how?

Opportunity

- Describe the environmental factors that support your use of Lámh?
- Describe the environmental factors that hinder your use of Lámh?
- Discuss the type of resources (if any) that would support your use of Lámh in the school environment.
- Discuss the impact of how having more supports (if any) would use of Lámh? (both materials and personal support)

Motivation

- Discuss your motivation to use Lámh?
- What would motivate you to use Lámh?
- How does using Lámh make you feel?

Appendix H. Results of COM-B Questions 9-11

Question 9: Capability

Category Code	Teachers		SNAs		Total	Examples of rationale provided
	n=55		***n=37***			
	Psychological Capability					
Importance and benefits	32	(58.2%)	25	(67.6%)	62%	*This would help me appreciate that this is the best approach for a child T15* *I would have to have more knowledge of the benefits T40* *The difference in communication is evident when Lámh is used vs not used so this helps me use Lámh as I know the benefits SNA18* *I would have to know the background to KWS SNA22* *I would have to understand why Lámh is beneficial SNA34*
Integrating Lámh	36	(65%)	24	(65%)	*65%*	*I am extremely lucky to be working with a teacher who works with Lámh and integrates it often when telling stories, singing songs and in the class Christmas play SNA1*

						I would have to have practical examples of the use of Lámh in daily activities would help me to make Lámh an integral part of the day T15 *Maybe some guidance around ideas for this going forward SNA18* *Yes having ideas and structure to help integrate it would help me use it more maybe T30* *I would have to learn more about how to use Lámh signs correctly because I am not trained T32* *I would have to know how to adapt activities to allow for integration of signs SNA34*
Range of available signs	30	(54.5%)	24	(64.9%)	*58.7%*	*I have a book that I can refer to if I forget a sign. It would be great to have an app you could write a word and they would show you the Lámh sign for SNA1* *As Mum to a child with DS, I completed a Lámh Family course. As an SET teacher, I am currently working with my third Lámh user and while the signs I acquired over the years are a wonderful help, I*

						generally have to search online for school-related signs or ask my work colleagues T21 *I would have to know more about more school related vocabulary which would be of a huge benefit in the school environment for the child/children involved T24* *I would have to know more school related signs to support use in the classroom SNA34* *I would need to know a wide range of signs to be capable of fully using Lámh SNA19*
Accessing Signs	33	(60%)	13	(35.1%)	*50%*	*I would have to have more information about Lámh and easy access to resources, I feel this would be very helpful to students and staff.* *I would have to know more about where to access Lámh signs as there is very limited resources available T24* *I would need more information about Lámh and easy access to resources, I feel this would be very helpful to students and staff SNA4*

I use my manual, follow on Instagram and subscribe to YouTube Silvia Angel. I also purchased the extra add-on words SNA5

I feel if you don't have Instagram it's difficult to find resources T5

Yes, and to have Lámh.ie to be reviewed to make it more user friendly T8

I found Lámh to be extremely beneficial for the student in my class, however the signs were not easily accessible to me, for example I had an EAL student in my class and I could quickly access resources in her home language online, whereas it was not always as simple for accessing Lámh resources T10

Having access to the hand book and especially the app on my phone allows me quick revision of an old sign and the ability to learn new signs as the need arises SNA9

It is very important that resources are freely available T15

Yes, I can forget the signs sometimes and it takes time to access them online, eg. you tube as I dont have a Lámh account T27

						These practical resources are what teachers need most. I would love to see more themed Lámh vocabulary on videos like those that Silvia Angel has on you tube. I find her themed videos really helpful and her material (sign of the day) is really easily accessed. Her videos have been the greatest support to me in planning and teaching Lámh T16 *Pretty confident I know where to find resources T18* *So that I could learn more about Lámh if I were to use it in the future T19* *I would like to have access to a wider range of Lámh signs T21* *I would have to find out more about where I can access information about Lámh T32* *I would like more access to information and training regarding LÃ¡mh and how it can be utilised in schools. In primary teaching courses, I feel that this is an area which needs to be highlighted more T39*
Resources Available	29	(52.5%)	17	(46%)	*50%*	*It would be nice to possibly do a follow-up course, possibly a 'Conversation Course' to practice in a group setting having*

conversations throughout Lámh with a tutor This would give great confidence to sign throughout the day. I don't know any further courses/resources available for an SNA regarding Lámh. SNA5

Yes, I have looked online but it is hard to find resources. I tend to just make my own T8

I would have to know what can support me and knowing who to contact e.g. the SLT that works with the child T30

I would have to know where to look to access resources and implement them

I agree with this as I am finding it difficult to find Module 2 classes T1

Our school will make that relevant training available to book SNA2

I would have to learn more about this as I feel it is very interesting and very beneficial within a school T9

I completed Module One Lámh during my undergraduate primary teaching degree, however I never followed up or heard from the practitioners after the one-day course. Had there been open

						communication and updates on training, I would have been more likely to continue on my professional development T10 *I would like to continue learning Lamh and increase my vocabulary, but find that there are not enough follow on courses available to Snas working in mainstream.* *It is also very difficult to access Lamh online. I have a paid subscription (since 2020), but feel that Lamh signs should be accessible to everyone ! SNA11* *Pretty confident I know where to find resources T18* *I'm having to google to find books read aloud using Lámh signs. It would be brilliant if there was a dedicated school resources section on the Lámh website for educators to access T24*
Supporting Lámh user	25	(45.4%)	13	(35.1%)	*41.3%*	*This is key to me as the school day as a teacher is absolutely manic and it needs to be done through daily activities that happen every day despite the madness! T4*

Although they have Lámh they very rarely use it to ask for help etc. They do answer questions using Lámh T5

This is my biggest issue. The child understands but doesn't really use signs at all. I sign constantly asking him to sign but he never does... occasionally! SNA5

Continue to use the lamh, 1 step up system introducing 1 new sign at a time until student has understanding and use of the new sign before introducing another. Be mindful not to introduce too many new signs in a short period of time. Collaborate with parent and guardians also ensuring its being reinforced at home and theyre aware of new signs SNA8

I would like to encourage the children to respond using Lámh. They understand it , but don't seem to respond using it T13

Ideas here are always welcome. I find the girl I work with loves music so I teach alot of Lámh through music and nursery songs. Also she loves playing with the ball so I often use the ball as an incentive to get

	her signing. e.g. I will show her a picture and get her to sign and say it. Once she does she can throw a ball in the box T16 *I would need a refresher course T18* *I found that a child I worked with in the past was reluctant to use Lámh T19* *this is important as she will only use lamh when someone signs to her first T22* *I would have to agree with this. The child in my class can be quite reluctant to use Lámh even with my encouragement T24* *I would like to have more time to allow the young Lámh user to learn more Lámh signs and ways for me to motivate and encourage them to participate in signing! I think training in this area would help SNA17* *I don't know enough about creating communication opportunities seamlessly T28* *Yes I think this would help me using it as I could see things from the users point of view SNA18*

						it would be great to also get more support about how best to create communication opportunities T31
Supporting peers	29	(52.6%)	16	(43.2%)	*49%*	*Yes this would be beneficial to Lámh students and their peers and teachers SNA4* *I would need practical day to day ways to encourage the pupil to sign throughout daily routine activities T4* *Because I use it every day the entire class has learned it T5* *A lot of incident's can arise from not being able to communicate with their peers. Leading to frustration and anger. Being left out of groups, no one to play with can be very hard on a child. I generally show a child a sign if I see they are trying to communicate with the child SNA5* *Start with using a simple sign and a sign that makes the user happy with their peers for example "play" young children adapt easily and when they see how happy the user is being able to communicate will encourage them to learn some more. Introduce 1 new sign a week to*

the whole class and make it relate to a subject on the curriculum eg easter, chocolate SNA8

Peers are actually probably the best to pick up and use Lámh. There's never any issue there which is wonderful T7

During my time teaching a child using Lámh, I made a conscious effort to teach important signs that were used daily to her peers in the class. I found the children really enjoyed using this, they used to call it their "secret language"! More videos and teaching resources using Lámh would certainly have encouraged the children to develop their learning further T10

The whole point of Lámh is to allow the pupils to communicate T15

It is really helpful for the children in the class to also use signs and to introduce it across the school community. I teach my pupils whole class Lámh signs once a week and once a month we teach them at assembly with the whole school T16

If I'm confident in my signs this would be easier T18

						So that the child using Lámh feels accepted by their peers T19 *Yes, it can be challenging to engage peers with this so knowing more about how to best support and encourage them would be good SNA18* *Any training refers to the Lámh user more than their peers and this is important to include when training school staff as peers are a big communication partner T41* *Yes this can easily be forgotten about and I did not think about it T30* *it is important to encourage all communication partners and ensure they are equipped with the key signs especially SNA19* *Encouraging peers is a different aspect that I feel we dont get as much support with T38* *I would have to know how the communication partners in the classroom can use signs T43*
Mental Stamina	8	(14.5%)	11	(29.7%)	*20.6%*	*This can be hard trying to remember every sign but it's worth it SNA1* *Comes naturally in Lámh environment. If its a struggle you need to reassess the situation SNA2*

						The more you sign the easier it gets SNA5 *not applicable really, yes you can forget but it is not a mental burden SNA18*
Supportive environment	30	(54.5%)	25	(67.6%)	*59.7%*	*I would have to have a supportive network of colleagues* *Yes I have lots of help in the classroom the teacher used Lámh and I learn new signs that way SNA1* *Yes this would be very helpful SNA4* *The whole school needs to know the fundamental information about Lamh for it to be succussful, in my experience, there are many many mainstream teachers who don't know what lamh is or why it would be used....e.g. for all the teachers who have never had a lamh user on their class or have never got the grounding in total communication you get from the module 1 training. If all staff (SNA and teachers) were armed with this information, this would make is soooo much easier to implement a lamh signing environment T4*

	I found it very helpful both the teacher & I learned Lámh together and helped and supported each other when signing throughout the day SNA5 *Our school has a very supportive lamh environment however lamh is not part of the overall department of education school curriculum therefore it is up to the individual school to implement it. This means that a child may use lamh in it own school but when they are in other environments eg extra curricular activities they may have no means to communicate with others SNA10* *Yes the support system in school helps using it, we can navigate the obstacles as a team (me, SNA, principal, resource teacher and SLT collaborating) T30* *I would need whole school involvement T22* *More staff would need to be trained T18* *Not all my colleagues in mainstream would have knowledge of Lámh signs T21*

						I would like to see all staff, who are supporting a Lámh user, to get training, I find in mainstream schools that not enough staff have Lámh! SNA17
	Physical Capability					
Physical skills	4	(7.2%)	10	(27%)	*15.2%*	*Some can be a little tricky but are all manageable with practice SNA5* *Some of the alphabet letters are tricky to sign but for the most part it is not difficult to sign words SNA1* *In this case we hand over hand until sign is familiar SNA2* *I find the letters a bit difficult but all Module 1 signs are accessible to most users T1* *If the child attemps the sign but doesnt have the motor skills to complete always repeat the sign correctly and when there motor skills develope encourage repeat the sign again SNA8* *I would have to have good coordination skills SNA34*
Physical stamina	3	(5%)	6	(16,2%)	*9.8%*	*I wouldn't have thought that this is relevant, it becomes part of your day SNA1*

						When being able to communicate successfully it outweighs any stamina issues. It does takes practice SNA5 *Not physically tiring SNA7* *Honestly i feel once you are using Lámh you won't stop SNA8* *Not a major concern T15* *also not an issue it is not a strenuous task by any means SNA18*
Knowledge of making the signs	17	(31%)	10	(27%)	*29.3%*	*Videos are a great help with the steps and hand actions SNA1* *Sometimes it can be difficult to follow for an unfamiliar word T5* *It can take some practice but with consistent use it gets easier SNA5* *I learned signs in isolation in Module One- I wouldn't be confident creating full sentences with the training I did. More training on how to make the signs would make me feel more confident in using it T10* *The more informed and more accurate we are signs will be more sure that all other Lámh users will understand it T15* *Yes this is important as you want to feel confident that you are making the sign correctly T16*

						So that I feel more competent if teaching a child that uses Lámh T19 *yes I think you need constant reminders of all the formations to make different signs T28* *I would have to take a professional course on how to make Lámh signs (the only 'training' I've received was as part of a TY module) T34*
Other	2	(3.6%)	3	(8.1%)	*5.4%*	*you need the whole school to adapt and use it* *peers in the class that are willing is a big thing*

Question 10: Opportunity

Category Code	**Teachers**		**SNAs**			**Examples of rationale provided**
	n=35		***n=25***			
	Physical Opportunity					
Time to integrate Lámh	31	(88.6%)	15	(60%)	76.6%	*Lamh is used throughout our day SNA1* *Part of our day naturally SNA2* *I would have to agree to a point. I integrate the use of Lámh as much as I can during the day T24*

	yes I think sign time or sign a day helps create opportunities and build this into my routine T28 *It is probably easier for me to integrate it during resource class time as it is protected 1 to 1 time T29* *I would have to plan for a few minutes each morning to integrate Lámh into my day (perhaps as part of 'our daily news') T34* *As an SNA my day is less structured than a teacher so I think less time is given to dedicated Lámh use it is more fluid throughout the day SNA19* *Maybe having dedicated Lámh time or a sign a day or week could help create opportunities SNA18* *Yes - the classroom is so busy it is hard to keep specific time set aside to use Lámh T30* *it can be busy so yes if we had more time maybe it would come easier T31* *Yes if I had more time to slow down and do it then could be easier to implement more often T38*

Time to plan Lámh use	23	(65.7%)	17	(68%)	*66.6%*	*I would need to ensure all lessons are tailored to include the child T19* *I think this is especially important at the start when you have never used Lámh before. You need time to plan what signs you are going to use, practise them and introduce and teach them T4* *You need time to meet with all parties involved with the child SEN, class teacher, SNA to make a proper plan and know when to use your signs T16* *including it in lesson plans is a helpful reminder T28* *Yes - if I thought I had more time to prep maybe I could think about the childs responses and not jsut me using the signs with the child T30* *There are time constraints on an over loaded curriculum T22* *Creating dedicated time during the day is fine as an idea but in a classroom, especially infants....the teacher barely has time to think T4* *It can be busy so yes if we had more time maybe it would come easier T38*
Materials	29	(82.9%)	22	(88%)	*85%*	*I would do another Lámh course but online course would be great also that you could log in at your own pace and time SNA1* *I would think this is important as I don't have this currently T5*

						If school helped pay for add on course or use of app this may encourage more to use it SNA9 *The necessary material needs to be more readily available and free to encourage everyone to learn Lámh. It is pointless the teacher and SNA using Lámh if child's family are not due to lack of resources SNA10* *This is a huge obstacle T8* *I would benefit from a refresher course T18* *Yes more support from the childs SLT to get more training T28* *Yes I think ongoing check ins from an SLT or tutor could help SNA18* *yes supports like training are needed SNA19*
Triggers and reminders	23	(65.7%)	24	(96%)	*78.3%*	*I would have posters displayed in all schools SNA2* *I would ask management to invest in Lámh posters for school building, internal and external T18* *visuals of the lamh signs used most often would be helpful to trigger me T28*

						Yes perhaps having some signs on a keychain visual or in posters in the school could help SNA18 *yes maybe posters or print outs of signs I plan to use in specific activities T29* *I do not have visuals up but this is a good idea T30* *visuals or keychains for new staff that are unfamiliar e.g. a substitute teacher SNA19* *I would have to make sure my classroom is set up in such a way that enables all children to use Lámh throughout the day (use of classroom displays & noticeboards) T34*
Financial gain	12	(34.3%)	7	(28%)	*31.6%*	*I don't think this is applicable, maybe financial support for the trainings but it is just part of my day SNA18* *That would be super but SNAs' salary is fixed SNA1* *I wouldn't agree with this but it would be encouraging if the school paid for the courses T1*

						Lámh courses are expensive so yes I agree with this as I would continue in the study of Lámh if there was a monetary benefit at the end T5 *SNA should get something for learning such a valuable communicate tool SNA5* *Yes please l paid for my QQI level 5 myself and took time off at my own expense, CPD hours at least would have been nice SNA7* *An incentive to use Lámh T19* *no I dont think this should be a factor, I use lamh because it is my duty as a teacher to ensure all children in my class can communicate, regardless of what means they may use T30*
		Social Opportunity				
Support from others	29	(82.9%)	25	(100%)	*90%*	*Ensuring all staff can communicate to ensure Lámh is embedded in the school community T1* *Working as a team just makes everything easier and has better results as you are learning and planning together and able to review what is working and what is not working T16*

						I would need a whole school initiative T22 *The whole school adopting Lámh would be very supportive T28* *A supportive environment is key SNA20* *Yes ensuring transfer of use between the resource class and main class by all colleagues supporting T29* *Yes - colleagues should support especially teachers that will have the user in their class in following years SNA18* *I would need support from others because if the class teacher doesn't use the signs I am teaching the child then I am just teaching them in isolation T27*
Use of Lámh by others	22	(62.8%)	22	(88%)	*73.3%*	*This would be in an idea world but moving towards this is great SNA1* *We use Lámh at whole school assembly SNA2* *All of my class use Lámh but not many of the staff members. They know little bits and pieces but I feel like every teacher should be taught it T5* *This is helpful as it encourages you to keep going as sometimes even the teacher becomes lazy especially if the child is verbal SNA9*

					I think everyone should learn Lámh to encourage inclusion SNA10 *This would create an environment that welcomes Lámh T19* *This would create more opportunities to use Lámh and build communication opportunities T40* *I would have to explain to pupils in the class how to use basic Lámh signs T32* *I would have to make sure other children & classmates are familiar with the use of Lámh, so that not all communication through Lámh is coming specifically from the teacher T34*

Question 11: Motivation

Category Code	**Teachers** ***n=25***	**SNAs** ***n=14***		**Examples of rationale provided**
	Automatic Motivation			
Feel that I want to sign	23 (92%)	10 (71.4%)	*84.6%*	*I get a sense of satisfaction when I see the children who are stuck being able to remember the word when I do the Lámh sign for it T5*

	I would have to use Lámh to support pupils in their journey through education and feel happy for them as they achieve their potential T32 *seeing the child that uses Lamh communicate with more ease does help motivate me to sign T28* *you are satisfied when you see the Lámh user able to respond T37* *I want to sign to prevent communication breakdowns T38* *I guess this is a factor as I find seeing the Lámh users face when he can be understood motivates me to continue using it T30* *Yes of course you need to be motivated to sign enough but seeing the Lámh user respond better is motivating in itself T31* *I would have to feel that Lámh is the most effective way to communicate T22* *When you see the child respond and communicate easier it brings such satisfaction SNA18* *When the child watches your hands when your signing. Knowing he is understanding. When we can share a story or a laugh SNA5*

						To know that the child understand totally what you are saying is important SNA1
Feel that I need to sign	13	(52%)	8	(57.1%)	*53.8%*	*I would feel bad if I forget or use the wrong sign it can have a big impact on the child T7* *Yes - you need to care about the consequences and want to prevent communication breakdown T29* *In moments of frustration or communication breakdown I see the impact forgetting signs can have T28* *yes caring about the negative outcomes of communication breakdown would motivate me to keep using it SNA26* *Yes I do find that when you build a rapport with the child that uses Lámh you feel motivated by the fact it is your responsibility to immerse their methods of communication SNA19* *yes - witnessing communication breakdowns really has an impact on my motivation to try prevent these by using Lámh more SNA18*

						Yes l would care about the impact on the child having no communications SNA7
Believe that signing is a good thing to do	17	(68%)	9	(64.3%)	*66.6%*	*I would need to believe it will promote an inclusive environment T11* *I would have to see first hand the benefits that using Lámh has for my students T34* *It is a good thing to do and easy to adapt so no reason why we should not all at least try T30* *Knowing that it works and is researched and proven to work also motivates me T16* *I believe that it's a child's right to be able to communicate and that we should do everything in our power to provide that for them whether it's PECS or Lámh or ISL T7* *I feel very strongly that we as teachers are not doing the child a favour or going above and beyond but simply providing a basic human right to speak and be heard T10*

						Until you work with a child with communication difficulties it is hard to establish this I think SNA18
	Reflexive Motivation					
Develop better plans	13	(53%)	8	(57.1%)	*53.8%*	*I would have to be more up to date on Lámh guidelines and practices within the classroom T34* *It is more motivating when it is another item on the list that gets completed T29* *If I was in the habit of adding it to lesson plans it might help motivate me and follow through T28* *I have found it more motivating to pre select my signs and practice them T16* *Take more time every day to learn signs I think I may need for following day SNA9* *Yes treat it like other goals in the classroom and set targets SNA18* *Planning is helpful SNA20*
Develop a habit	20	(80%)	14	(100%)	*87.2%*	*I would have to make Lámh part of my daily routine in the classroom T34*

	I feel that this is important because it normalises using Lámh on a regular basis throughout the school day T32 *Yes it is now a part of my day and I don't need to think about it as much so it is less work and easy to be motivated T30* *Yes - when it becomes second nature to use it I guess it is more motivating as I see the benefits T297* *I'm motivated by the habit of using it all these years SNA19* *It becomes habit when you are using it daily in school SNA18* *It would be more motivating to be able to use it without thinking and not have to check the manuals SNA10* *If it was more common maybe if more people in the community used it maybe the child would use his signs too and I would be motivate SNA5* *It is all about practice SNA20*