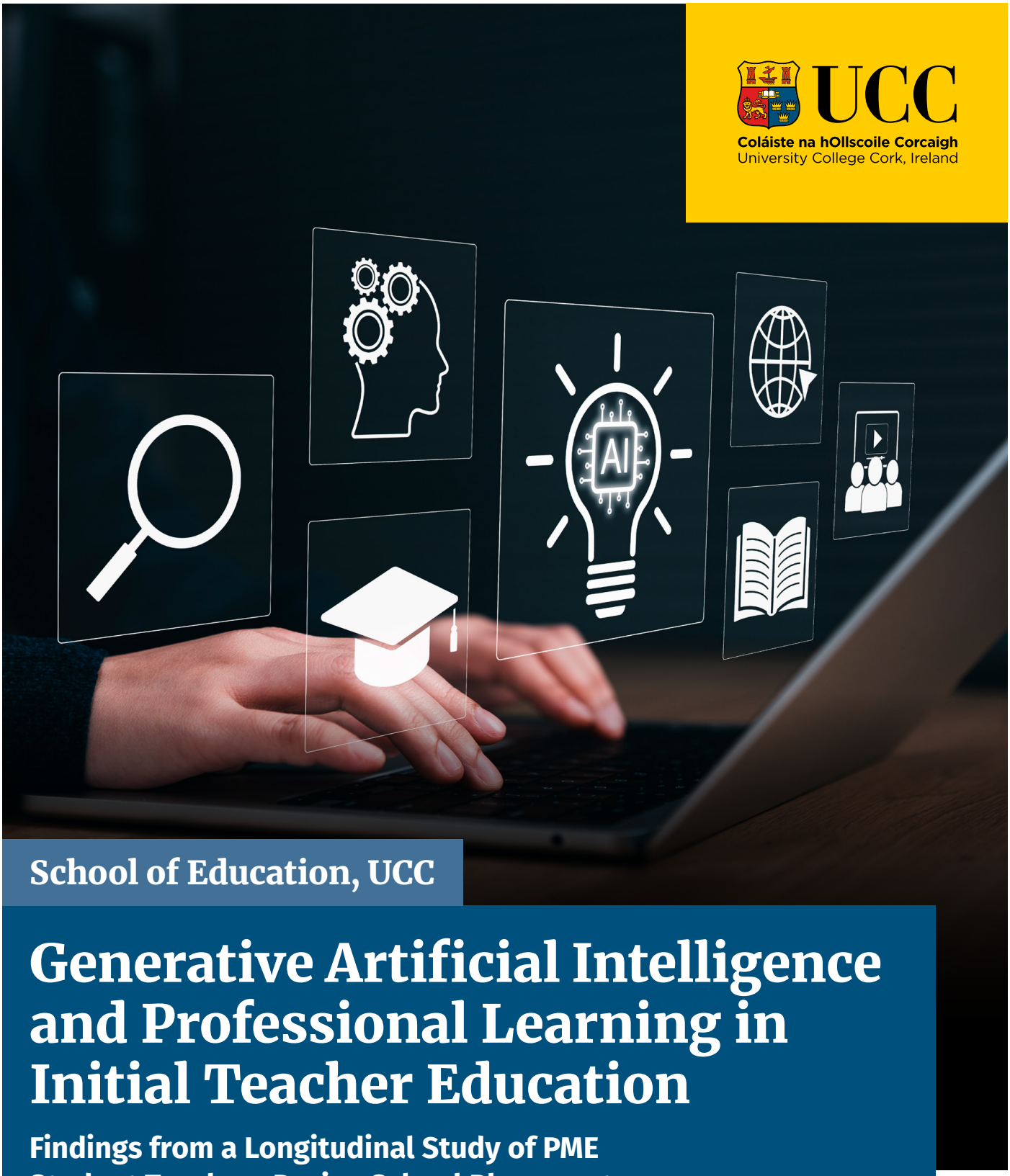

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Coláiste na hOllscoile Corcaigh
University College Cork, Ireland

School of Education, UCC

Generative Artificial Intelligence and Professional Learning in Initial Teacher Education

Findings from a Longitudinal Study of PME Student Teachers During School Placement

SATLE Final Project Report 2025 - 2026

Craig Neville, Lorraine Chadwick, Caroline Conlon

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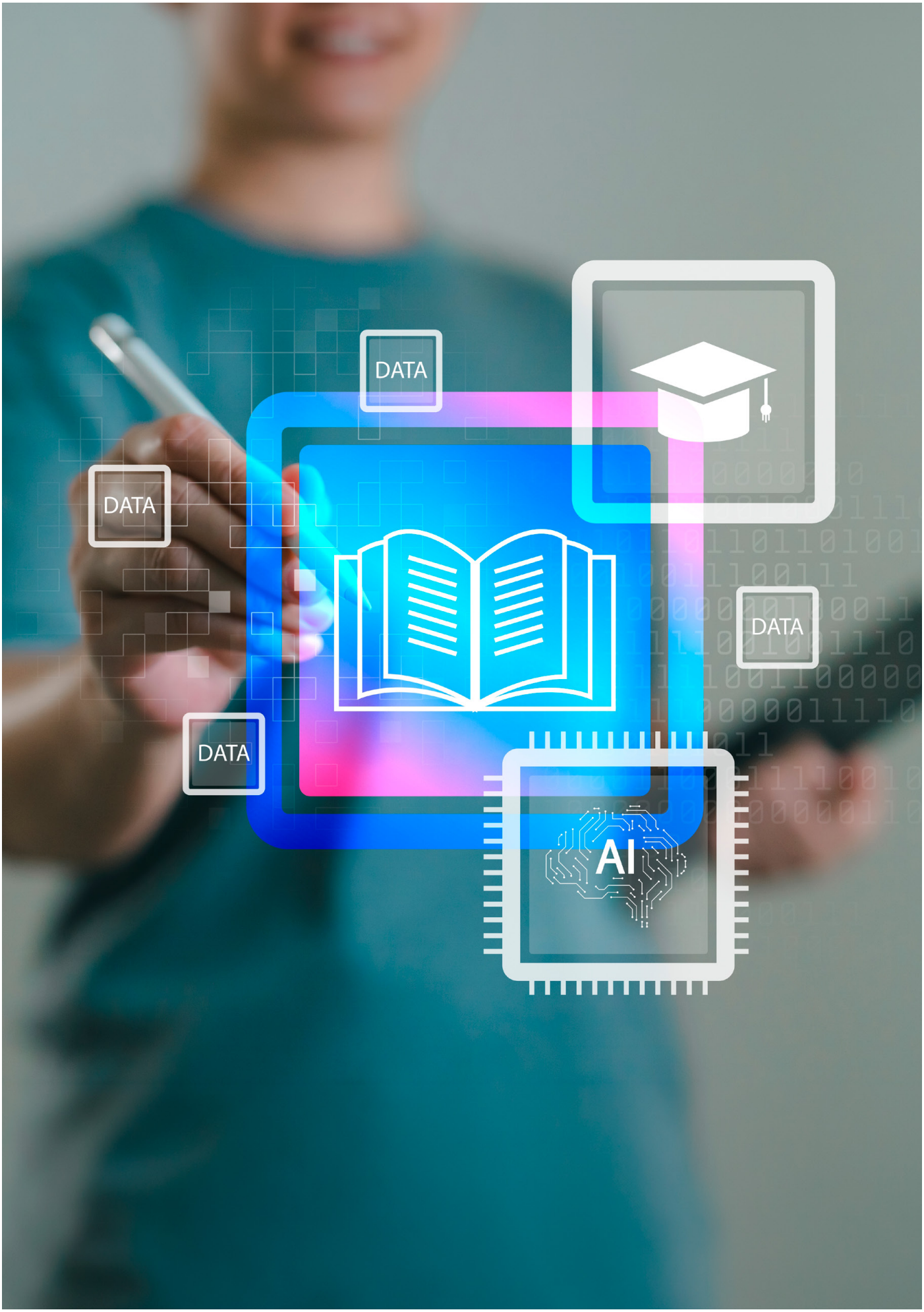
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List of Acronyms

AEN	Additional Educational Needs
AfL	Assessment for Learning
AI	Artificial Intelligence
BS	Business Studies
CIRTL	Centre for the Integration of Research, Teaching and Learning
CT	Cooperating Teacher
CTs	Cooperating Teachers
EAL	English as an Additional Language
GenAI	Generative Artificial Intelligence
HE	Home Economics
ITE	Initial Teacher Education
LLM	Large Language Models
MFL	Modern Foreign Languages
PME	Professional Master of Education
SATLE	Strategic Alignment of Teaching and Learning Enhancement
ST	Student Teacher
STs	Student Teachers
SWOT	Strengths, Weaknesses, Opportunities and Threats
UCC	University College Cork

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Finally, we would like to thank the many student teachers (STs) enrolled in the Professional Master of Education (PME) programme for their contributions to this research. Their daily interactions on school placement have always been at the centre of our work, and we greatly appreciate the time they took to contribute professionally to and reflect critically upon the research, despite the considerable demands and pressures of their own studies.

The principal aim of this research has been to explore how we, as educators in initial teacher education (ITE), can respond to the emergence of Artificial Intelligence (AI) but more particularly, Generative AI (GenAI), within our teaching, learning and assessment practices. We hope that we have done justice to the experiences and perspectives of our PME students, and that the findings presented here will encourage continued reflection on the future of ITE in Ireland and further afield.

Craig Neville

Lorraine Chadwick

Caroline Conlon

Executive Summary

Purpose

Generative Artificial Intelligence (GenAI), hereinafter referred to as Artificial Intelligence (AI), is becoming an increasingly significant feature of contemporary education, including Initial Teacher Education (ITE). While much attention in higher education has focused on academic integrity, assessment and student use of AI in written assignments, less is known about how student teachers (STs) engage with AI during school placement as part of their professional learning. This report presents findings from the SATLE-funded project *'Smart Support? AI-Assisted Placement',* which explored how STs use AI, how they perceive its value and risks, and how their AI literacies, competencies, values and attitudes develop across one year of the PME programme at University College Cork.

The study focused particularly on AI use in the practicum context, where STs are required to plan lessons, create resources, respond to learner needs, reflect on teaching and engage in professional dialogue with tutors, ITE educators and cooperating teachers (CTs) / (treoraithe). The project was designed to move beyond broad questions about whether STs use AI and instead examine how AI is being used, why it is being used, how it is interpreted across different disciplines and what this means for teacher education. The study focused in depth on three contrasting subject areas: Business Studies (BS), Home Economics (HE) and Modern Foreign Languages (MFL). These subjects were selected because they represent different pedagogical traditions and professional demands: content-driven, skills-based and practically oriented.

Methodology

The project adopted a longitudinal, mixed-methods and multi-stakeholder research design. This design enabled the research team to examine patterns of AI use over time while also capturing the meanings, tensions and professional judgements that participants attached to AI during school placement. Quantitative data were generated through baseline and end-of-year questionnaires with PME students and school placement tutors. These questionnaires explored participants' technological confidence, AI knowledge, AI literacy, AI competence, AI tool use and future intentions regarding AI.

The qualitative component included ST focus groups, AI-integrated assignments, stimulated recall sessions, ITE educator and tutor focus groups, and a collaborative hackathon involving STs and CTs. Three discipline-specific student focus groups were conducted with BS, HE and MFL STs. First year BS, HE and MFL PME students also completed an AI-integrated assignment in which they generated an AI-assisted lesson plan using Microsoft Copilot, adapted that output into their own lesson planning and reflected critically on the opportunities and limitations of AI. Later in the year, stimulated recall sessions used these assignments as prompts to explore STs' decision-making in greater depth.

The project also incorporated the perspectives of ITE educators, school placement tutors and CTs. Tutor questionnaires and focus groups provided insight into how educators interpreted ST AI use, while the hackathon explored how AI might support professional dialogue between CTs and STs. This multi-method design allowed the project to triangulate STs, tutors, ITE educators and CTs perspectives, producing a richer account than would have been possible through any single data source.

Key Findings

- **AI is already embedded in STs' school placement practice,** particularly for lesson planning, brainstorming, resource and worksheet creation, translation/adaptation, differentiation and supports for learners with AEN and EAL. More complex uses, such as assessment, data analysis and evaluative tasks, remain relatively uncommon.

- **STs primarily use AI as a practical support rather than a replacement for teaching.** AI was valued for overcoming the anxieties of the 'blank page', generating ideas, reducing workload and providing starting points for professional decision-making, particularly under the time pressures of school placement. STs nevertheless recognised the need to check, adapt and contextualise AI-generated outputs.

- **STs' AI competencies developed over the year, although unevenly.** STs' self-reported AI literacy marginally increased as well as their self-reported ability to integrate AI pedagogically. The latter, however, was to a lesser extent. Also, reflective and critical dimensions of AI competence showed less development, particularly in relation to questioning trust, attitudes and their own use of AI.

- **STs demonstrated an emerging ethical and human-centred orientation towards AI.** They generally viewed AI as a tool to support, rather than replace, professional judgement, relational teaching and knowledge of individual learners' needs. Particular caution was expressed around assessment, personalised feedback and reflective writing, alongside concerns about transparency, overreliance, authenticity and environmental sustainability.

- **Critical evaluation of AI-generated content remains a significant area for development**. Although STs recognised the need to verify outputs, evidence from tutors and ITE educators suggested that this was not always consistently enacted. Problems included hallucinated learning outcomes, inaccurate information and knowledge, generic lesson plans, poor curriculum alignment, 'Americanised' examples and limited sensitivity to the Irish school context.

- **Subject-based differences shape how STs perceive the affordances and risks of AI.** MFL STs focused particularly on linguistic accuracy, translation, communicative authenticity and AI-generated pupil work; HE STs emphasised inclusion, differentiation, safety, pacing and skill development; and BS STs prioritised curriculum alignment, assessment and contextual appropriateness.

- **Tutors and ITE educators broadly shared STs' cautious optimism about AI.** They recognised its growing role in planning, resource creation and pedagogical reflection, while raising concerns about overreliance, undeclared use, weak critical evaluation and the potential dilution of professional thinking. They highlighted the need for clearer guidance, ethical expectations and professional development for both students and staff.

- **AI also has potential to strengthen school placement partnerships and mentoring.** The hackathon demonstrated how AI could be used to scaffold dialogue between CTs and STs around lesson planning, units of learning, classroom tasks and reflection. Its value lies in supporting professional dialogue and collaborative learning rather than replacing the expertise of the CT.

Conclusion

There are five central conclusions that emerge from our research:

- **AI is already part of ITE and school placement practice.** The question is no longer whether it should be used but how it can be integrated responsibly and professionally.

- **AI should scaffold, not replace, teacher thinking.** Its greatest value lies in supporting planning, creativity, adaptation and workload management while preserving professional judgement and reflection.

- **AI literacy and competency are now core professional competencies for teachers.** STs need to understand AI as well as use it effectively, critically, ethically and contextually.

- **STs' AI competence is developing, but unevenly.** In particular, critical evaluation, reflective use and awareness of limitations require more explicit and structured support within ITE.

- **AI integration needs to be understood as a shared professional and institutional responsibility.** Effective use involves STs, tutors, ITE educators and CTs, and should be embedded within professional learning, subject pedagogy and school-placement partnerships.

Recommendations: Practice, Policy and Research

Practice

- AI literacy should be embedded explicitly within ITE programmes from the beginning of the academic year, with particular attention to responsible use, critical evaluation, ethical awareness and professional judgement.
- AI-related learning should focus not only on how to use tools, but on how to evaluate outputs, detect hallucinations, identify bias, check curriculum alignment and adapt AI-generated material for specific learners and classrooms.
- Discipline-specific AI guidance and exemplars should be developed for all subjects, recognising that AI use is shaped by subject-specific pedagogical demands.
- STs should be supported to use AI for inclusive practice, including differentiation, adaptation of resources and support for AEN and EAL learners, while maintaining teacher responsibility for contextual and learner-sensitive decisions.
- Reflective practice around AI should be strengthened. STs should be asked to consider not only what AI helped them produce, but how it influenced their thinking, judgement, confidence, creativity and professional identity.

Policy

- A clear AI use policy should be developed for school placement and portfolio work. This should include guidance on appropriate use, declarations, transparency, reflective writing, assessment-related tasks and professional boundaries.
- AI training should be extended to tutors, ITE educators and CTs. A shared understanding of appropriate AI use is needed so that STs receive consistent guidance across programme and school placement contexts.
- The School of Education should consider developing shared resources, to be used across all programmes, including AI declaration templates, critical evaluation checklists, sample prompts, subject-specific examples and guidance for AI-supported mentoring conversations.

Research

- The AI-informed protocols developed through the hackathon should be refined and piloted in authentic placement settings, particularly as tools for supporting CT-ST professional dialogue.
- Further research should examine how AI use influences teaching practice, lesson quality, placement feedback, pupil learning, professional judgement and teacher identity development over time. This should include observation-based studies and more detailed subject-specific research across a broader range of ITE contexts.

Chapter 1: Project Overview

1.1 Introduction

AI has emerged as one of the most significant developments shaping contemporary education at all levels. In higher education, much scholarly attention hitherto has focused on teaching, learning and assessment more generally, particularly issues related to academic integrity and ethical practice. However, comparatively little research has examined how learners engage with AI during the practicum elements of their professional learning within structured undergraduate or postgraduate programmes.

The ways in which learners use AI as part of their academic studies have become increasingly apparent in recent years (e.g., essay writing, AI-assisted reading of documents, planning written assignments and conducting research). At the start of this project, what remained less clear to us as researchers, however, was how STs, engaged in professional placements, are using AI to support the development of their professional knowledge, skills and competencies. Understanding how STs engage with AI in these contexts is particularly important given that they will be among the first generation of educators expected to work in schools where AI technologies are commonplace.

At the start of this year-long project, research at the intersection of the practicum elements of ITE and AI-assisted competence development was scarce. However, over the course of 2025-2026, more research has emerged, revealing key research trends in this space. These are dealt with in more detail in the literature review below.

The PME at University College Cork provides a unique context for exploring these issues. The programme includes extensive school placement experiences that require STs to engage in lesson planning, critical reflection, professional dialogue and portfolio development. Anecdotal evidence from School of Education staff suggested that AI tools were already being used by STs throughout these processes, yet little was known about the purposes for which they were being used, how STs perceived them, or how AI might influence their professional learning and development.

Funded through the SATLE initiative, the *Smart Support? AI-Assisted Placement* project sought to explore STs' knowledge, values, beliefs and attitudes towards AI, as well as their developing AI literacy and competency during school placement.

The purpose of this overview is to provide a brief introduction to the emerging body of research exploring the role of AI in school placement and professional practice settings. In doing so, it identifies key themes and gaps within the existing literature that informed the design, implementation and interpretation of this study.

1.2 AI in ITE: Emerging approaches to professional learning - a thematic review of the role and use of AI in ITE practicum scenarios.

AI has been framed as one of the most significant developments to influence all sectors of contemporary education and the ITE sector is no exception. There has been increased attention directed towards the role and use of AI in the practicum element of ITE. As future educators enter schools where AI technologies are increasingly commonplace, ITE programmes are faced with the challenge of preparing STs to independently engage with AI critically, ethically and pedagogically. STs also need to be equipped to leverage AI's affordances to help support professional learning, planning and preparation, reflective practice, school placement, and more recently, professional identity development (Albadarin *et al.*, 2024; Blonder, Feldman-Maggor & Rap, 2024; Mintz *et al.*, 2023).

Thus, the emerging literature in this field suggests that AI is assuming three roles in ITE specifically related to the practicum element. These include:

Reflective practice & simulation
→ Support reflective practice
→ Simulate classroom experiences
→ Strengthen teacher identity
→ Promote teacher wellbeing

Professional competence
→ Acquire
→ Develop
→ Refine

Pedagogical assistant
→ Lesson planning
→ Resource development
→ Instructional design

These studies (Albadarin *et al*., 2024; Blonder, Feldman-Maggor & Rap, 2024; Mintz *et al*., 2023) collectively point to a shift from viewing AI merely as a technological tool towards understanding it as a mediator of professional learning and development.

1.2.1 AI literacy as a core professional competence in ITE

One prominent strand of research conceptualises **AI as a professional competence** that future teachers must develop. AI literacy is generally understood as extending beyond technical proficiency to include critical evaluation, ethical awareness, responsible use and informed pedagogical decision-making (Alonso-García *et al*., 2025; Estrada-Molina *et al*., 2025; Moorhouse *et al*., 2024). Throughout the report, we frame this as a new requirement of 'AI teacher knowledge' and 'AI teacher literacy' that underpin overall competency in this area. The former describes what teachers need to know about AI and the latter refers to leveraging this knowledge to use AI efficiently, critically and responsibly.

Studies examining **STs' attitudes towards AI** consistently report generally positive perceptions of its potential. Pre-service teachers frequently identify AI as a useful resource for accessing information, generating ideas and supporting professional tasks (Doğan, 2026; Kumari *et al*., 2025; Lucas *et al*., 2025). However, this optimism is often accompanied by concerns regarding reliability, trustworthiness and the potential erosion of critical thinking. Several studies report that STs remain uncertain about how to evaluate AI-generated outputs and frequently acknowledge the need for further training and guidance (Doğan, 2026; Korucu-Kış & Bakla, 2026; Moorhouse *et al*., 2024). Indeed, this lack of certainty may also be born out of a lack of practical experience.

Importantly, recent research suggests that **AI literacy should not be reduced to operational competence alone.** For example, studies examining STs' engagement with AI indicate that many participants readily accept AI-generated pedagogical advice without substantial critical evaluation (Korucu-Kış & Bakla, 2026; Zhang, N. *et al*., 2025b). Similarly, research exploring pre-service teachers' investment in AI-facilitated learning-to-teach practices found that participants often positioned AI as an expert authority, raising concerns regarding over-reliance and diminished professional judgement (Zhang, N *et al*., 2025b). These findings suggest that the central challenge may not be whether STs can use AI but whether they can engage with it critically and maintain ownership of pedagogical decision-making. As highlighted above, the agency that a ST feels that they can exercise over an AI output may be due to practical inexperience.

1.2.2 AI as a pedagogical and reflective partner

Beyond the development of AI literacy as a core professional competence, other research positions AI as **an active partner in STs' professional learning** (Korucu-Kış & Bakla, 2026; Li *et al*., 2025; Al-Nofaie & Alwerthan, 2024). Within this literature, AI is not simply viewed as an object of learning but as a resource that supports pedagogical thinking, lesson planning, instructional design and reflective practice. This represents a significant shift in emphasis, moving from questions about whether teachers should use AI towards questions about how AI can support the development of professional competencies.

The most **common application of AI in teacher education** involves **lesson planning, resource development and instructional design.** Across a range of contexts, STs report using AI tools to generate lesson ideas, create teaching materials, design assessments and adapt learning activities for diverse learners (Korucu-Kış & Bakla, 2026; Li *et al*., 2025; Al-Nofaie & Alwerthan, 2024; Lee & Youn Ahn, 2021). In this way, STs frequently describe AI as a brainstorming partner that assists them in overcoming creative blocks and generating alternative approaches to teaching and learning (Doğan, 2026; Li *et al*., 2025). There is also some evidence that it helps to reduce workload and provide rapid access to pedagogical resources.

Several studies suggest that, when used in this way, AI may contribute positively to the quality of instructional planning. For example, interventions involving AI-assisted lesson planning have demonstrated improvements in instructional organisation, learner engagement, technology integration and the application of pedagogical principles within lesson design (Pargmann *et al*., 2025). Similarly, research examining AI-supported lesson study and collaborative planning found that AI facilitated the generation of new teaching ideas and encouraged STs to consider alternative instructional approaches (Lee & Youn Ahn, 2021). In these contexts, AI appears to function less as a replacement for pedagogical expertise and more as a scaffold that supports planning and professional judgement.

However, the research also highlights some **core limitations** when AI is used in this way. While AI-generated lesson plans and resources may provide useful starting points, STs consistently report the need to evaluate, adapt and contextualise AI outputs before they can be used effectively in classroom settings (Debreli, 2026; Li *et al*., 2025; Al-Nofaie & Alwerthan, 2024). Concerns regarding inaccuracies, fabricated information, generic responses and inappropriate recommendations based on the contexts in which STs are undertaking practicum elements are recurring themes across studies. Consequently, researchers frequently argue that the value of AI lies not in automating pedagogical decision-making but in supporting teachers' own professional judgement (Debreli, 2026; Pargmann *et al*., 2025). Indeed, some studies caution that excessive reliance on AI-generated plans may reduce opportunities for independent pedagogical thinking and potentially undermine the development of professional expertise (Doğan, 2026; Zhang, N. *et al*., 2025b). Thus, the portent of 'cognitive offloading', a concern of the academic development of learners more widely, may also influence the development of skills required for professional contexts such as teaching.

Alongside lesson planning, **AI is increasingly being used to support reflective practice.** Reflection has long been recognised as a central component of teacher development, enabling STs to connect theory and practice, evaluate their teaching and refine their professional judgement. Recent studies suggest that AI may provide new opportunities for structured reflection by functioning as a feedback provider, reflective partner or critical friend (Erbay-Cetinkaya, 2026; Erbay-Çetinkaya, 2025; L'Enfant, 2024). For example, STs frequently describe increased awareness of classroom dynamics, greater recognition of their strengths and weaknesses, and improved capacity to analyse teaching experiences critically as a result of using AI for reflection (Erbay-Cetinkaya, 2026). This is perhaps because AI-generated feedback can encourage consideration of alternative perspectives, prompt deeper questioning and support metacognitive engagement within professional practice (L'Enfant, 2024).

While AI may help STs to not only develop the habits of reflective practice but also engage in it, **the quality of AI-supported reflection appears to vary considerably.** Several studies report dissatisfaction with generic or superficial AI-generated feedback and note that AI responses often lack the contextual understanding required for deeper professional reflection (Erbay-Cetinkaya, 2026; Wang *et al*., 2025). STs generally value human feedback more highly because it is perceived as more credible, contextually relevant and responsive to the complexities of classroom practice (Zhang, C. *et al*., 2026; Wang *et al*., 2025). A clear conclusion appears to be that **AI is most effective when used alongside human support** rather than as a substitute for teacher educators, mentors or peers. Indeed, machine-human interactions are viewed as complementary rather than exclusive when AI is used as part of professional reflection. While AI can provide rapid, detailed and scalable feedback, human mentors continue to play an important role in providing contextual interpretation, emotional support and professional judgement (Zhang, C. *et al*., 2026; Wang *et al*., 2025). Emerging evidence therefore suggests that the most productive approaches involve hybrid models in which AI supports reflection and analysis while human educators facilitate interpretation and professional learning.

1.2.3 AI-supported practice, simulation and practicum learning

While early studies of AI in teacher education focused primarily on literacy, readiness and instructional planning, more recent research has begun to explore how **AI can support the development of professional competence through authentic and simulated teaching experiences.** This represents a significant shift in the literature, moving beyond the use of AI as a productivity tool towards its use as a context through which practice-based professional learning can be refined. Classroom simulation appears to be particularly effective in this regard.

One of the most promising developments involves the use of AI-powered simulations that allow STs to practise teaching in low-risk environments. Drawing upon principles of practice-based teacher education and experiential learning, these simulations provide opportunities for repeated engagement with authentic teaching challenges before entering real classrooms (Zhang, N. *et al*., 2026; Tegero & Mabini, 2025; Zhang, N. *et al*., 2025a). Rather than simply discussing teaching strategies, STs are required to apply them in dynamic situations involving AI-generated learners who can respond, question, challenge and interact in real time.

Research consistently suggests that these environments support the development of core teaching competencies. In studies using AI-powered virtual students and chatbot simulations, STs reported improvements in lesson delivery, instructional decision-making, communication skills, classroom management and pedagogical confidence (Tegero &

Mabini, 2025). Similarly, simulations designed to support responsive and dialogic teaching enabled participants to practise questioning techniques, facilitate classroom discussions and adapt their teaching in response to student thinking (Zhang, N. *et al*., 2026; Zhang *et al*., 2025a). In these contexts, AI functions as a pedagogical sandbox in which STs can experiment with different approaches, make mistakes and refine their practice without the consequences associated with real classroom settings.

A significant feature of this literature is its **emphasis on professional judgement and adaptive expertise.** Rather than viewing teaching as the application of predetermined strategies, many studies conceptualise effective teaching as the ability to interpret complex classroom situations and respond appropriately. Research examining AI-supported simulations found that STs developed stronger capacities to interpret learners' ideas, identify misconceptions and respond to learners' cognitive and emotional needs (Zhang *et a*l., 2025a). These findings suggest that AI may support the development of responsive teaching by providing opportunities for repeated cycles of interpretation, decision-making, action and reflection.

The potential of AI to support practicum learning is further illustrated by studies that examine **its role during school placements.** In these contexts, AI is often used to supplement traditional mentoring arrangements by providing immediate access to pedagogical advice, lesson-planning support and professional guidance (Debreli, 2026; Korucu-Kış & Bakla, 2026). STs frequently describe AI as an accessible source of support when mentors are unavailable, using it to seek advice regarding classroom management, instructional strategies and assessment practices (Korucu-Kış & Bakla, 2026). This suggests that AI may help address some of the challenges associated with practicum experiences by providing ongoing support beyond formal supervisory structures.

However, the literature also highlights important limitations. Although simulations can approximate classroom practice, **they cannot fully replicate the complexity of real teaching.** Several studies report that AI-generated outputs may produce repetitive, unrealistic or contextually inappropriate responses, limiting the authenticity of interactions (Zhang, N. *et al*., 2026; Zhang, N. *et al*., 2025a). Participants also noted the absence of many non-verbal and relational aspects of classroom life, including body language, emotional nuance and peer-to-peer interactions. As a result, researchers generally position AI-supported simulations as complements to, rather than replacements for, authentic practicum experiences.

A similar pattern emerges in studies examining **AI-generated feedback.** Research comparing AI-based feedback with teacher feedback demonstrates that both approaches can improve aspects of teaching performance and self-efficacy (Zhang, C., *et al*., 2026; Wang *et al*., 2025). AI-based feedback offers several advantages, including immediacy, scalability and detailed analysis of teaching behaviours. Using multimodal analytics, AI systems can identify patterns in questioning, discourse and classroom interaction that might otherwise go unnoticed (Wang *et al*., 2025). Such findings suggest that AI may offer valuable opportunities for supporting reflection on practice and providing targeted developmental feedback.

Nevertheless, **STs consistently perceive human feedback as more credible, useful and contextually relevant** than AI-generated feedback (Zhang, C., *et al*., 2026; Wang *et al*., 2025). While AI can identify patterns and provide analytical insights, it often lacks the contextual understanding and relational sensitivity required to interpret classroom events meaningfully. Consequently, several authors advocate hybrid or complementary approaches that combine the analytical strengths of AI with the professional expertise of mentors and teacher educators. This position aligns with a broader trend across the literature, which views AI as a complement to human professional support rather than a replacement for it.

Taken together, these studies suggest that AI is beginning to play a more substantive role in teacher education than simply supporting lesson preparation or resource generation. The literature points towards a growing recognition that AI may be most valuable when it supports learning through practice rather than simply providing information to the ST.

1.2.4 AI, professional identity, agency and emotional development

A particularly recent and theoretically significant strand of research has begun to move beyond questions of competence acquisition and pedagogical performance to examine **how AI influences broader dimensions of teacher development.** This literature recognises that becoming a teacher involves more than acquiring technical skills or

pedagogical knowledge; it also involves the development of professional identity, agency, confidence, resilience and emotional wellbeing. Within this emerging body of work, AI is increasingly conceptualised not simply as a tool for completing tasks but as a resource that shapes how STs understand themselves and their future professional roles.
Research examining AI-supported internships found that STs who engaged with AI-assisted teaching, assessment and communication tools reported stronger perceptions of professional value, professional authority and confidence than those participating in traditional internship experiences (Zheng, 2025). Importantly, these participants also reported lower levels of identity-related anxiety, suggesting that AI may help ease some of the uncertainties associated with the transition from student to teacher. Such findings indicate that AI may influence not only what STs can do, but also how they perceive themselves as emerging professionals.

Similarly, research exploring pre-service teachers' investment in AI-facilitated learning-to-teach practices highlights **the complex relationship between AI use and professional identity development** (Zhang, N., *et al*., 2025b). In the latter study, while participants frequently described AI as a valuable source of pedagogical support, they also tended to position AI as an expert authority. In some cases, this led STs to view their own knowledge and expertise as less valuable than AI-generated advice. This finding introduces an important tension within the literature. Although AI may enhance confidence and provide support, it may also shape how STs understand professional expertise and authority. Consequently, researchers have argued that teacher education programmes must ensure that AI strengthens rather than diminishes STs' sense of professional agency and judgement (Zhang, N., *et al*., 2025b).

Questions of agency are explored most explicitly in studies examining AI use during practicum experiences. Drawing upon ecological perspectives on teacher agency, Debreli (2026) argues that the benefits of AI are not automatic but depend largely on the extent to which STs retain control over how AI is used and adapted within their teaching. Participants in this study reported that AI enhanced their professional autonomy when it functioned as a flexible resource that could be modified, critiqued and contextualised. Conversely, when AI-generated content was perceived as prescriptive or when institutional expectations constrained how AI could be used, participants reported reduced feelings of ownership and professional control. These findings suggest that agency may play a mediating role in determining whether AI contributes positively or negatively to professional learning.

The **emotional dimensions of AI** use have also begun to attract scholarly attention. Discussions in relation to educational technology have traditionally focused on cognition and performance; however, recent research highlights the mixed emotions that STs feel when engaging with AI-based technologies. In Özer-Altınkaya (2026), students commonly describe feelings of curiosity, excitement and creativity when using AI tools, particularly during the initial stages of engagement. At the same time, uncertainty, frustration and anxiety often emerge when AI-generated outputs are inaccurate, unclear or difficult to adapt to specific educational contexts. Therefore, helping students to manage expectations and reliance on such tools should be an important part of their AI-mediated reflective practice.

Perhaps the most innovative contribution within this literature comes from studies exploring **AI as a resource for resilience and future-orientated professional development.** Fan (2026), for example, developed an AI system that allowed STs to engage in dialogue with a simulated future version of themselves as experienced teachers. The findings indicated that this intervention enhanced professional identity and resilience, providing participants with opportunities to connect present challenges with future professional aspirations. Unlike many AI applications that focus primarily on task completion, this approach positions AI as a tool for supporting professional becoming. The study suggests that AI may facilitate forms of reflection that help STs construct coherent narratives about their future careers and develop greater confidence in their ability to navigate professional challenges.

Collectively, these studies indicate that AI is influencing dimensions of teacher development that extend beyond competence acquisition. Professional identity, agency, confidence, resilience and wellbeing are emerging as important outcomes of AI-supported learning experiences. At the same time, the literature highlights the need for caution. AI may simultaneously empower and constrain, support and undermine, depending on how it is integrated into teacher education contexts.

1.2.5 Critical synthesis and research gaps

The conclusions of this literature review are that AI is being integrated into teacher education in ways that extend beyond the development of technical competencies. Below we summarise some of these key conclusions and research gaps.

Key conclusions

- AI is most commonly used by STs to support lesson planning, the development of resources, assessment design and pedagogical problem-solving.
- AI-supported reflective practice can enhance professional awareness, self-reflection and pedagogical reasoning, particularly when combined with peer, mentor or teacher educator support.
- AI-powered simulations provide valuable opportunities for practising classroom management, dialogic teaching, responsive teaching and instructional decision-making in low-risk environments.
- Emerging evidence suggests that AI may contribute to the development of professional identity, resilience, agency and wellbeing, particularly during practicum experiences.
- Across studies, the most effective approaches position AI as a complement to, rather than a replacement for, human mentors, supervisors and teacher educators.

Research gaps

- Most studies rely on self-reported perceptions rather than direct evidence of changes in teaching practice.
- Longitudinal research examining how AI influences teacher development over time remains largely absent.
- There is limited evidence regarding how STs use AI during authentic school placements and practicum experiences.
- Much of the literature is concentrated within English language teacher education, with comparatively little research in other disciplinary contexts.
- Theoretical development remains limited, with many studies focusing on tool use rather than broader questions of professional learning, identity formation, agency and practice.
- There is a need for research examining how STs draw upon existing AI knowledge and experiences within professional contexts and how these interactions contribute to the development of new forms of professional learning.

Chapter 2: Methodology

2.1 Introduction

This chapter outlines the research design adopted for the study. It provides an overview of the study's aims and objectives, discusses the ethical considerations relevant to the research and describes the methodology employed to collect and analyse the data.

2.2 Study aims and objectives

The aim of the research is to explore how PME STs' knowledge, values, beliefs, and attitudes toward AI - as well as their AI literacy and competency - develop across school placement. The research will also focus on three subject areas that represent different post-primary teaching demands: BS (content-driven), HE (practically orientated) and MFL (skills-based). These areas reflect a broad range of pedagogical approaches, allowing us to explore how AI is used and perceived across different disciplines.

Objectives:

1. Examine how STs use AI generally and as part of their school placement portfolio.
2. Identify the AI tools or platforms STs use when developing their portfolios.
3. Investigate STs' perceptions of AI as an assistive tool.
4. Investigate tutors' and ST educators' perceptions of the impact of AI on ST development.
5. Map STs' AI literacy and AI competency across school placement.

For the purposes of this report, we conceptualised AI literacy with reference to the OECD - European Union's *AI Literacy Framework for Primary and Secondary Education*. Although our participants were STs, we considered it important that their AI literacy should be at least commensurate with the expectations established for the students they will teach. Accordingly, we understand AI literacy as 'the technical knowledge, durable skills and future-ready attitudes required to thrive in a world influenced by AI' (OECD - European Union, 2026, p. 6). This encompasses the capacity to engage and create with AI, manage its use, influence its development, and critically evaluate its benefits, risks and ethical implications. For AI competency, we utilised the lens employed by Chiu (2025) who aver that AI competency is the capacity to apply AI effectively, ethically, critically and contextually in classrooms.

2.3 Ethical approval

Ethical approval for this study was granted by Social Research Ethics Committee, University College Cork, prior to data collection. The research involves adult participants and was designed in accordance with established ethical principles of voluntary participation, informed consent, confidentiality, and data protection.

2.4 Research methodology

A mixed-methods research design was adopted to provide both breadth and depth of understanding of the role of AI in PME ITE placement preparation and planning. The quantitative component of the study consisted of questionnaire data collected from participants at the beginning and end of the academic year, enabling the identification of patterns, trends, and changes over time. The qualitative component incorporated a range of methods, including focus groups, reflective written data, stimulated recall discussions, and collaborative co-design activities. These approaches facilitated an in-depth exploration of participants' experiences, perceptions, and interpretations. The integration of quantitative and qualitative data allowed for the triangulation of findings, enhancing the validity and richness of the study by combining broad descriptive insights with detailed contextual understanding. An overview of the methodology is provided in Figure 1 on the following page of this report.

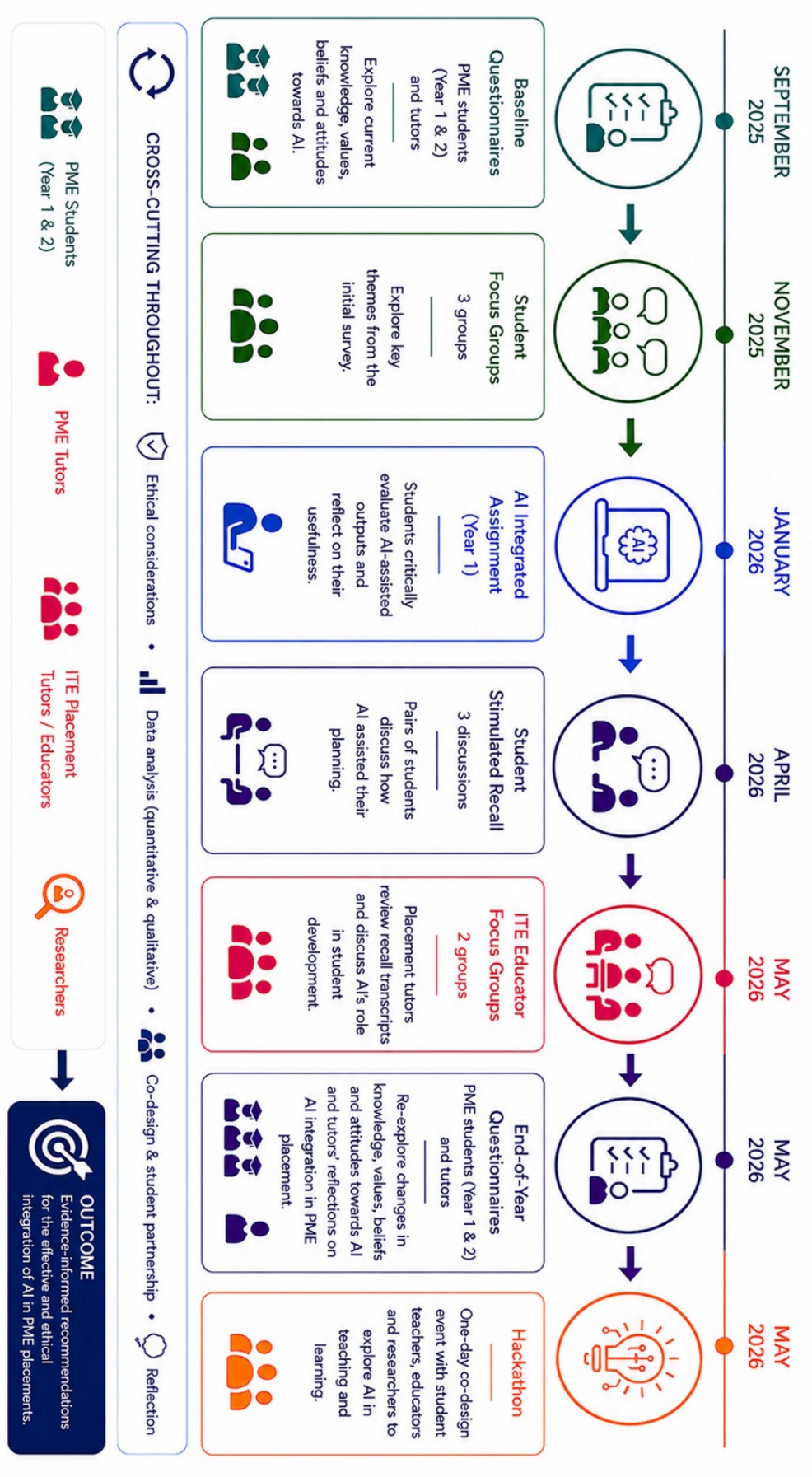


Figure 1 - Summary of research design, OpenAI ChatGPT (2026)

2.4.1 Questionnaires

Questionnaires were used to collect data from PME students and school placement tutors throughout the study. All PME Year 1 and Year 2 students were invited to complete an online questionnaire (via Qualtrics) in September 2025 to establish baseline data regarding their current knowledge, values, beliefs, attitudes, and experiences relating to AI. A follow-up questionnaire was administered in May 2026 to explore any changes in participants' AI literacy, competencies and perceptions following their engagement with AI during the school placement year. School placement tutors were also invited to participate in online questionnaires (via Qualtrics) at the beginning and end of the academic year to capture their perspectives on AI and its integration within PME school placement. The questionnaires contained a combination of question types, generating both quantitative and qualitative data. This approach enabled the collection of broad descriptive information while also providing opportunities for participants to elaborate on their experiences and viewpoints in greater depth. The collected qualitative data was analysed using statistical analysis software (JASP and SPSS).

2.4.2 ST focus groups

Three ST focus groups (comprising of PME 1 students) were conducted in November 2025 to further explore key themes emerging from the initial survey data. In total, three discipline-specific groups were held: BS (n=5), HE (n=5) and MFL (n=5). The purpose of these focus groups was to gain a deeper qualitative understanding of STs' discipline-specific experiences, perceptions and attitudes towards AI in the context of school placement.

A co-design and co-inquiry approach was adopted throughout this phase. Following an initial review of survey findings, STs were actively involved in co-creating the focus group design and discussion protocols. This participatory approach positioned the STs as co-researchers rather than passive participants. The focus groups were also ST-led to reduce power imbalances, minimise researcher bias and encourage more open and authentic discussion. Given the potentially sensitive and contested nature of AI use and academic integrity in higher education, this approach was intended to reduce social desirability bias and conformity effects, thereby supporting more honest and reflective responses.

2.4.3 AI integrated assignments

PME Year 1 STs completed an AI-integrated assignment (1500 words) during semester 1 2025/2026, which was implemented across the three subject-specific disciplines. The assignment was designed to incorporate structured use of AI and consisted of four distinct components:

- Part 1 asked students to generate a lesson plan, using Microsoft Copilot, for a subject- specific lesson. This output served as an initial AI-generated artefact.
- Part 2 required students to create their own annotated lesson plan using the UCC School of Education PME 1 template, adapting and integrating elements of the AI-generated version where appropriate, while ensuring alignment with subject-specific pedagogical principles.
- Part 3 required a reflective commentary critically evaluating the planning and delivery of the lesson.
- Part 4 focused specifically on AI use, requiring STs to reflect on the opportunities and limitations of AI in lesson planning and preparation.

Across parts 1 and 4, STs critically evaluated AI-generated outputs and reflected on their usefulness in supporting pedagogical decision-making. Following submission, the assignment was marked and feedback was provided through standard institutional procedures. STs were then asked to provide informed consent for the use of part 4 of their assignment - the reflective record - as part of the research analysis in this study. These were anonymised once consent was received.

2.4.4 Stimulated recall activity

Stimulated recall is a qualitative research method used to examine participants' thoughts and cognitive processes when they are prompted with a specific stimulus. It is frequently used in educational research as a form of guided retrospective reflection, enabling participants to revisit and articulate their decision-making and reasoning after an event or activity has taken place (Zhai *et al.*, 2024). Three stimulated recall sessions with PME Year 1 STs were

conducted, one within each of the three discipline areas, with two students participating in each session. The stimulus for each session was the participating students' semester 1 assignment, which was used to prompt reflection and discussion on their decision-making and use of AI during the task. Delayed reflection was employed, as the stimulated recall sessions took place in April 2026, approximately three months after submission of the assignment. The stimulated recall protocol was co-designed by STs and researchers, with a questioning strategy structured from general to more specific prompts. The sessions were ST-led to encourage open discussion and reduce power imbalances between STs and researchers. While delayed reflection may have introduced possible limitations, the data collection was restricted by the marking of assignments (i.e., ensuring that all assignment grades and feedback had been released before the stimulated recall took place). However, we also believe that the delay provided the ST participants with reflective distance during which time their lesson planning and AI skills had likely developed during placement. This may have afforded them a greater level of informed criticality when reviewing the assignments.

2.4.5 PME educator focus groups

Two focus groups were conducted with PME educators and school placement tutors following the stimulated recall phase of the study. Each focus group consisted of three participants and was designed to explore educators' perspectives on the role of AI in ST development. Prior to the focus groups, participants were provided with transcripts from the stimulated recall sessions to familiarise themselves with STs' experiences and reflections on AI use during lesson planning and preparation.

Key themes were identified (Braun and Clarke, 2021) from the stimulated recall data and these were used to inform the focus group discussions. A semi-structured interview protocol was employed to provide consistency across sessions while allowing participants the flexibility to explore emerging issues and share their professional insights. The discussions focused on participants' interpretations of STs' use of AI, its potential contribution to professional learning and pedagogical development, and the opportunities and challenges associated with integrating AI within school placement. The focus groups generated rich qualitative data that complemented the STs' perspectives gathered throughout the study.

2.4.6 Hackathon

Hackathon events share common features, including being collaborative, time-bound and organised around an overarching theme that participants work together to address (Adinda *et al.*, 2025). STs from PME Year 1 and Year 2, along with CTs, were invited to participate in a two-hour hackathon event (n=10). The event was structured around predetermined challenges, which are illustrated in Figure 2.

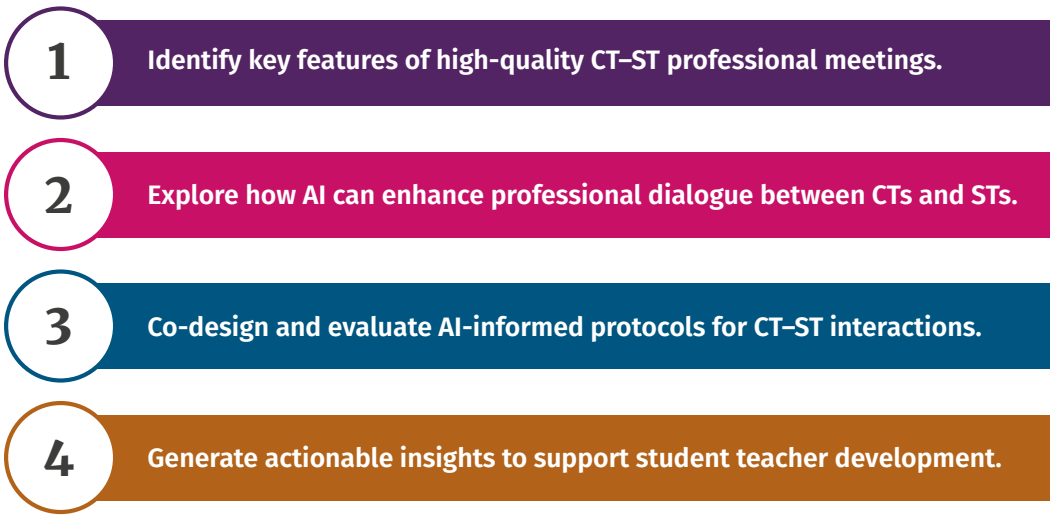


Figure 2 - Aims of the Hackathon event

Chapter 3: Study Findings

3.1 Introduction

This section of the report presents the findings from the SATLE-funded research project exploring the role of AI within ITE and, more specifically, how STs engage with AI technologies during school placement. Drawing on data generated through baseline and post-research questionnaires, ST focus groups, AI-integrated assignments, ST-stimulated recall discussions, educator focus groups and a collaborative hackathon, the findings provide a multifaceted account of participants' experiences, perceptions and practices relating to AI use within educational settings.

As AI technologies become more deeply integrated within contemporary educational settings and practice, understanding how STs engage with these tools is of growing importance. School placement represents a critical site of professional learning where STs negotiate the relationship between theory and practice, develop professional identities and acquire the knowledge, skills and competencies necessary for teaching. Consequently, the integration of AI within this context raises important questions regarding pedagogical decision-making, digital competence, professional judgement and ethical practice.

The findings presented in this section of the report move beyond documenting patterns of AI use - they curate the meanings participants attached to these technologies, the opportunities and challenges they encountered and the implications for teacher education. The words of the participants are shown in italics throughout the section. Collectively, the data offers insight into how STs are navigating an increasingly AI-mediated educational landscape and highlights the evolving role of AI within professional learning and classroom practice.

Where statistics do not match (i.e. reported ages vs. confidence in technology), this is due to all survey items being voluntary as per ethical requirements. Any data entries that were significantly lacking in data (< 85%) were removed from the dataset before analysis.

3.2 Baseline questionnaires: students and teacher educators

Participants in the pre- and post-surveys were from across a range of disciplines. Those coming from BS, HE and MFL, the disciplines that were in focus later during this study, represented 38.1% of all participants. The total number of participants represents the total number of subjects taught while noting that most participants teach in two different disciplinary areas.

Table 1 - Distribution of participants by disciplinary area

Subject	Count	%
Business Studies	60	16.7
MFL*	46	12.8
Home Economics	31	8.6
English	55	15.3
History	54	15.0
Geography	31	8.6
CSPE	31	8.6
Art	22	6.1
Music	11	3.1
Mathematics	7	1.9
Religious Education	7	1.9
Science	5	1.4
Total	**360**	**100.0**

**MFL = Gaeilge (10) + French (7) + German (7) + Spanish (10) = 34.*

3.2.1 Student teacher age

As expected, the majority of those in the study cohort were in the 18-24 age bracket (77%, n=147) followed by those in the 25-34 age bracket (20%, n=38). Most participants fell into the younger category, many of whom had recently graduated with an undergraduate degree qualification. Given that the ages were skewed in this way, age was not a factor that we analysed.

Table 2 - Age distribution of participants

Age Group	Count	%
18–24	96	70.2
25–34	36	26.3
35–44	3	2.1
45-54	2	1.4
Total	**137**	**100.0**

The age profiles of the three focal subject specialisms differed noticeably. HE STs were overwhelmingly concentrated in the 18–24 age group (96.8%), indicating a predominantly direct transition into teacher education. BS also displayed a relatively young profile, although one-fifth of participants were aged 25 years or older. In contrast, MFL exhibited the oldest profile, with almost one-third (30.4%) of STs aged 25–34, indicating a greater presence of mature entrants and more varied pathways into the profession. Additionally, this may also account for them having longer degree programmes which incorporate time abroad to perfect their language skills.

Table 3 - Age distribution by subject specialism

Subject	18–24 n (%)	25–34 n (%)	35–44 n (%)	Total
Business Studies	48 (80.0%)	9 (15.0%)	3 (5.0%)	60
MFL	32 (69.6%)	14 (30.4%)	0 (0.0%)	46
Home Economics	30 (96.8%)	0 (0.0%)	1 (3.2%)	31
English	44 (80.0%)	11 (20.0%)	0 (0.0%)	55
History	45 (83.3%)	9 (16.7%)	0 (0.0%)	54
Geography	28 (90.3%)	3 (9.7%)	0 (0.0%)	31
CSPE	14 (45.2%)	16 (51.6%)	1 (3.2%)	31
Art	14 (63.6%)	7 (31.8%)	1 (4.5%)	22
Music	8 (72.7%)	2 (18.2%)	1 (9.1%)	11
Mathematics	5 (71.4%)	2 (28.6%)	0 (0.0%)	7
Religious Education	6 (85.7%)	1 (14.3%)	0 (0.0%)	7
Science	4 (80.0%)	0 (0.0%)	1 (20.0%)	5

3.2.2 Baseline general technological knowledge and self-perceived AI knowledge

In the pre-and post-survey instruments, STs were asked to rate their confidence generally in using technology. Our assumption was that if participants felt more confident using technology, then this was likely to correlate with their use of AI. It's important to remember that the pre- and post-surveys were not conducted to evaluate the impact of an intervention. They were simply taken at the beginning and the end of the academic year to see if there was any change after a year of teaching on placement.

STs reported higher levels of confidence with technology [Table 4 and Figure 3] at the end of the year. However, these analyses should be interpretated with caution given the different sample sizes reported in the pre- and post-survey, as there is a risk of bias due to attrition. Despite this, mean confidence increased from 6.56 (SD = 1.91) in the pre-survey to 7.11 (SD = 1.48) in the post-survey, representing a statistically significant difference, $t = -2.37$, $p = .019$. The effect size was small to moderate ($d = 0.32$), suggesting a modest but meaningful improvement in technological confidence. However, confidence levels did not differ significantly across age groups, $F(2,178) = 1.66$, $p = .193$. This provided further justification for excluding age as an independent variable.

Table 4 - Descriptive statistics for confidence in technology (Pre-and post-survey)

Statistic	Pre-survey	Post-survey
N	140	79
Mean	6.56	7.11
SD	1.91	1.48
Min	1	3
25%	6	6
Median	7	7
75%	8	8
Max	10	10

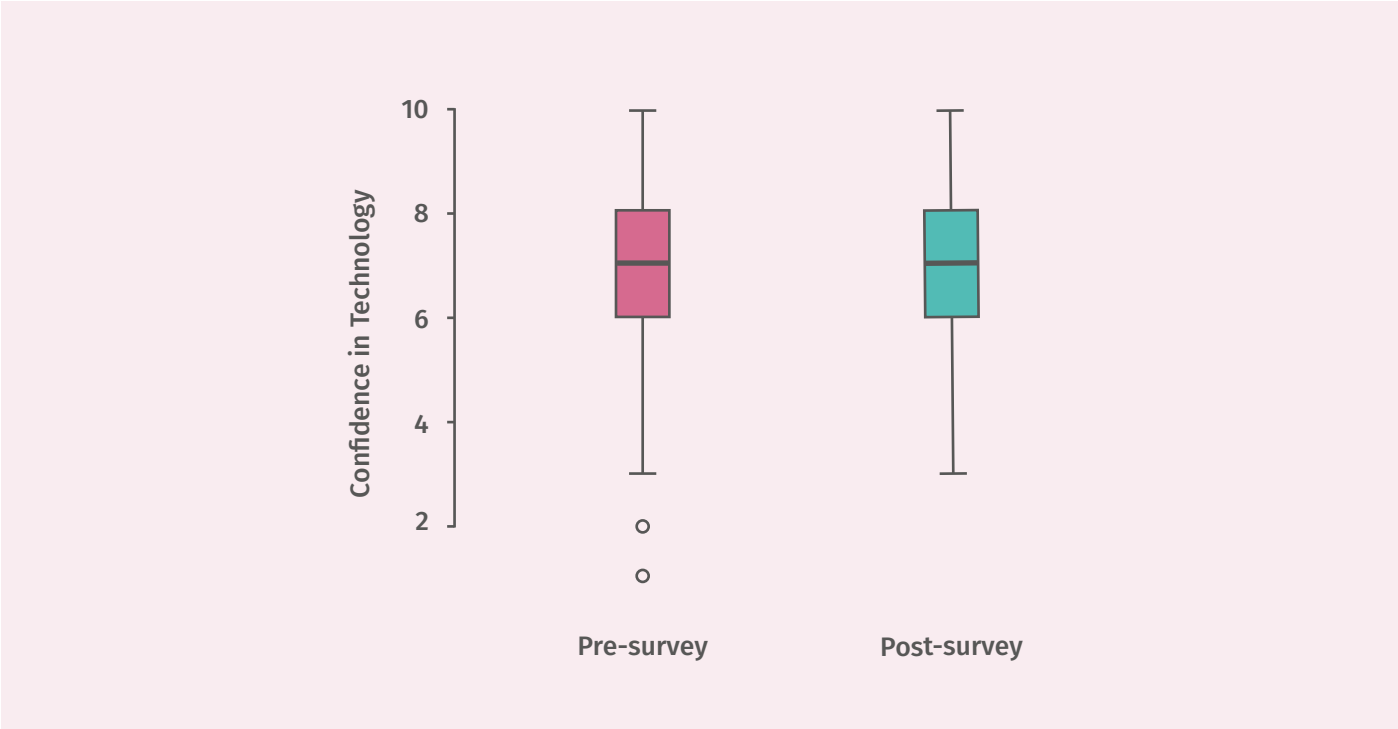


Figure 3 - Pre- and post-survey confidence in technology scores

STs were also asked to rate their understanding of AI. They reported moderate levels of understanding of AI at both survey points. Mean self-reported AI understanding was 3.52 (SD = 0.65) in the pre-survey and 3.39 (SD = 0.91) in the post-survey. The distributions were similar, with substantial overlap between the two groups and comparable interquartile ranges. While the post-survey responses exhibited greater variability, there was no clear descriptive evidence of an increase in self-reported AI understanding at the end of the year. Indeed, the slightly lower post-survey mean may suggest that STs developed a more nuanced awareness of the complexity of AI and consequently assessed their own understanding more cautiously.

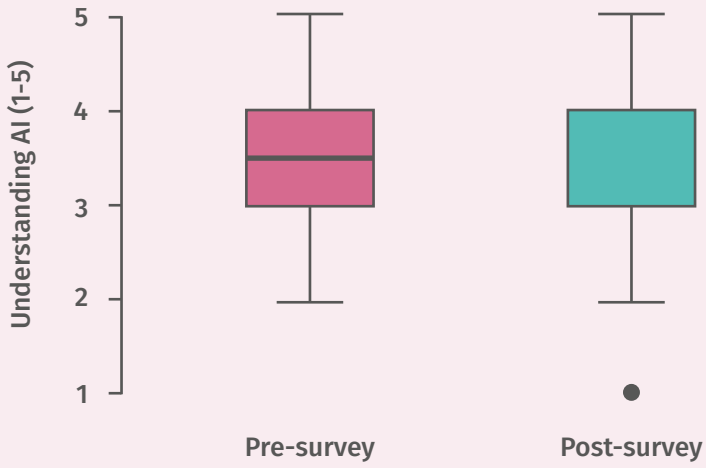


Figure 4 - Pre-and post-survey self-reported AI understanding scores

When STs' general confidence in technology was compared with their self-reported confidence in using AI, a statistically significant positive relationship was observed. Pearson's correlation indicated a moderate positive association, $r = .341$, $p < .001$, which was corroborated by Spearman's rank correlation, $\rho = .353$, $p < .001$. These findings suggest that STs who reported greater confidence with technology were also more likely to report higher levels of confidence in their understanding of AI. However, the relationship was moderate in magnitude, indicating that technological confidence alone does not fully explain confidence in AI. Thus, 11.6% of the variance in AI confidence was associated with technology confidence.

The heatmap [Figure 5] visually supports these findings. The highest concentrations of participants are clustered around technology confidence scores of 6–8 out of 10 and AI understanding scores of 3–4 out of 5. The distribution shows a clear tendency for higher AI understanding ratings to occur alongside higher technology confidence ratings. However, the spread of responses also indicates considerable variability. Some STs reported relatively high confidence with technology but only moderate confidence in their understanding of AI, suggesting that general technological confidence does not automatically translate into confidence with AI.

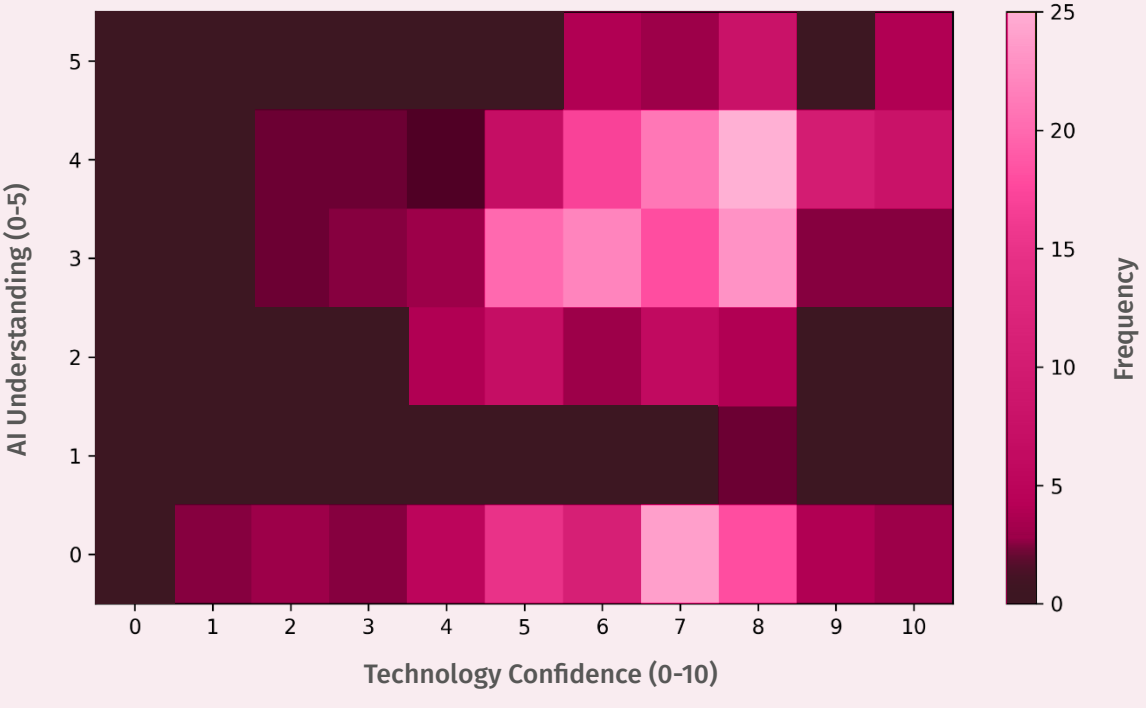


Figure 5 - Heatmap of the relationship between technology confidence and AI understanding

3.2.3 Baseline AI literacies and AI competencies

Both pre- and post-survey instruments sought to operationalise AI literacies and AI competencies so that they could be measured objectively. To measure AI literacies at the pre-stage, eight 5-point Likert-scale items were developed, focusing on statements describing features of AI and Large Language Models (LLMs) that were true and false. STs had to say whether they disagreed strongly, partially disagreed, neither agreed nor disagreed, partially agreed or agreed strongly with the statements. Each point of the Likert scale was coded numerically in the following way:

Table 5 - Coding scheme for AI literacy Likert-scale items

Disagree strongly	-2 or +2
Partially disagreed	-1 or +1
Neither agree nor disagreed	0
Partially agree	+1 or -1
Agree strongly	+2 or -2

For every selection made, participants were given a score, e.g. for a false response that they strongly disagreed with they would be awarded +2 points, for a true response that they partially agreed with they were awarded +1. This then generated an overall score, the maximum for which could be +16 and the least could be -16.

STs reported higher levels of AI literacies in the post-survey (M = 3.13, SD = 2.78, *n* = 79) than in the pre-survey (M = 2.13, SD = 2.46, *n* = 140). The median score increased from 2.00 to 3.00, indicating an overall upward shift in perceived understanding of AI. Although variability remained relatively high at both survey data points, the box-and-whisker plot suggests that improvements were evident across the distribution rather than being driven by a small number of participants. These findings indicate a positive increase in STs' AI literacies. However, one clear observation is that the AI literacies of participants widened. Although the number of STs who took the post-survey reduced, this still did not affect the widening AI literacies score [Table 6 and Figure 6].

Table 6 - Descriptive statistics for AI literacies (pre-and post-survey)

	AI Literacies Score (Pre-survey)	AI Literacies Score (Post-survey)
Valid	199	79
Missing	10	4
Median	2.000	3.000
Mean (arithmetic)	2.126	3.125
Std. Deviation	2.464	2.782
Minimum	-6.000	-5.000
Maximum	8.000	12.000

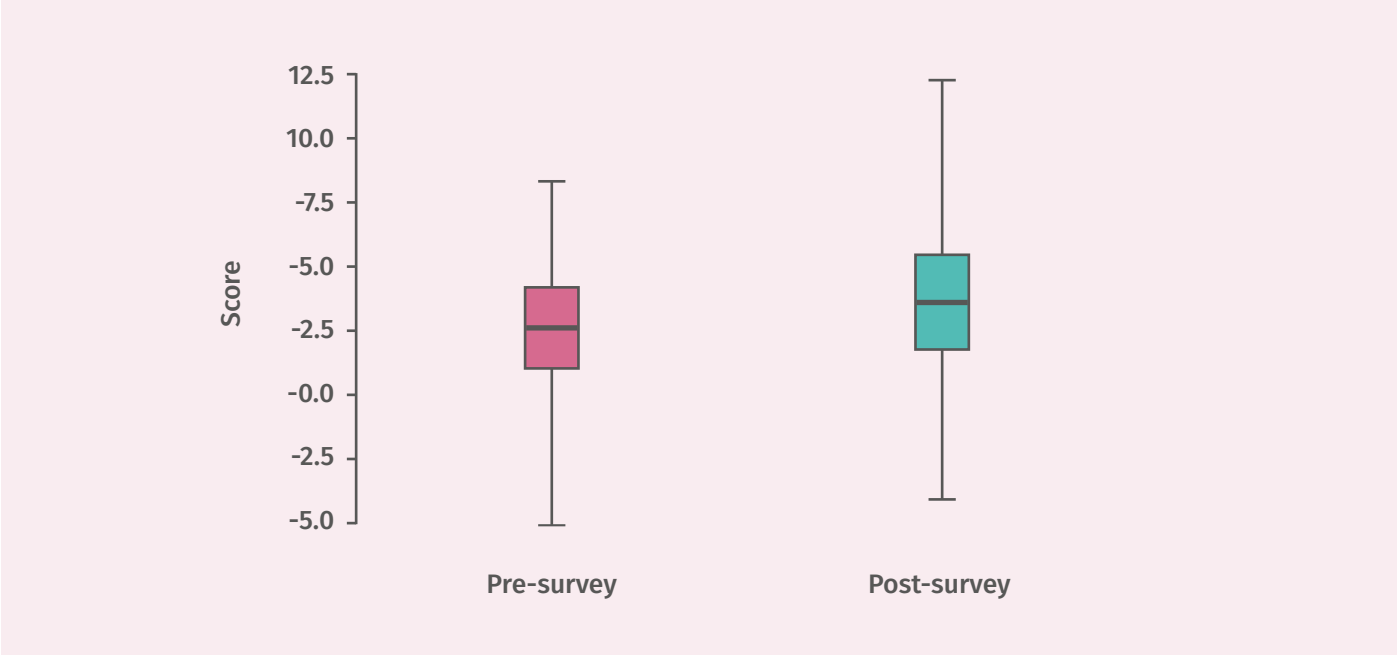


Figure 6 - Pre-and post-survey AI literacies scores

When these baseline measures of AI literacies are compared in the pre-survey according to the different disciplines (BS, HE and MFL), there are few observable differences. For the purposes of this analysis, only PME 1 STs were included as they also formed the focus of our later focus groups.

Descriptive statistics indicated broadly similar levels of AI literacy across BS, HE and MFL. For Subject 1 selections, mean scores ranged from 1.96 (BS) to 2.69 (MFL), while HE STs reported a mean score of 2.00. For Subject 2 selections, mean scores ranged from 1.75 (HE) to 2.57 (MFL), with BS STs reporting a mean score of 2.15.

One-way ANOVA analyses confirmed that the observed differences were not statistically significant. For Subject 1 selections, there was no significant effect of subject area on AI literacy, $F(2, 79) = 0.761$, $p = .471$. Similarly, for Subject 2 selections, no significant differences were observed across subject areas, $F(2, 79) = 0.311$, $p = .734$.

Overall, the findings suggest that participants at the start of the year have comparable levels of AI literacy regardless of whether they studied BS, HE and MFL. This indicates that baseline AI literacy was relatively consistent across the three subject domains and that subsequent differences observed are unlikely to be attributable to pre-existing differences between subject groups.

3.2.4 AI-based tool use

At the pre-stage, STs were also asked about how they use AI-based tools during their practicum experience. When participants responded to the pre-survey, they were already one month into their practicum experience and perhaps had already begun to experiment with AI-based technologies.

Participants were asked to indicate which AI-based tools that they used. The tools were then recoded into different uses (see categories in Table 7). The analysis of reported AI uses revealed that *all* participants (100%, $n = 210$) employed one or more AI-based tools that helped them to create teaching materials and content, including brainstorming, worksheet development, and the translation or adaptation of resources. Lesson planning and teacher preparation represented the second most common category ($n = 130$, 62.2%), followed by interactive and pupil-facing supports such as text differentiation and differentiation strategies ($n = 109$, 52.2%). Less frequently reported uses included productivity and multimodal creation tasks such as homework support and assessment creation ($n = 49$, 23.4%), writing and academic support activities such as drafting ST reflections and responding to tutor feedback ($n = 23$, 11.0%), and data analysis or evaluative uses ($n = 15$, 7.2%). Overall, the findings suggest that STs primarily engaged with AI as a tool to support planning, resource development, and instructional adaptation, while more advanced evaluative and analytical applications remained relatively uncommon.

Table 7 - Categories of AI use during practicum (pre-survey)

Category	Activities Included	Total Uses (n)	% of Sample (n=137)
Teaching materials & content creation	Brainstorming; Worksheets; Translating/adapting materials	210	100%
Lesson planning & teacher preparation	Lesson plans; Long-term planning; Finding resources; Policy analysis	130	62.2%
Interactive / student-facing supports	Differentiating texts; Differentiation strategies	109	52.2%
Writing & academic support tools	Student reflections; Responding to tutor feedback	23	11.0%
Productivity & multimodal creation	Homework support; Creating assessments	49	23.4%
Data analysis / evaluative uses (closest fit to AI-assisted evaluation)	Assessing student work; Analysing placement data	15	7.2%

The total number of tools used across the cohort was 536. When the total number of tools was analysed by category, this showed that 39.2% of individual AI-tool uses were for teaching materials and content creation (see Figure 7).

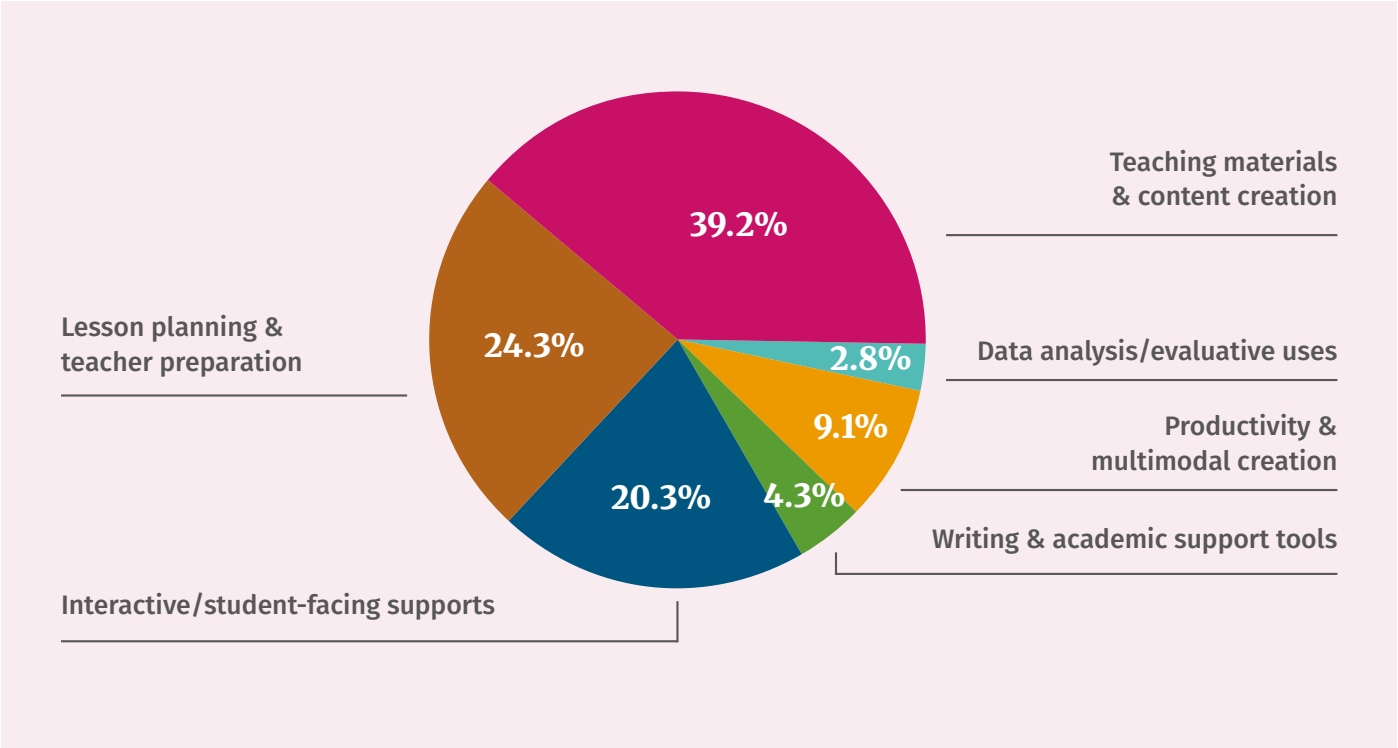


Figure 7 - Percentage distribution of AI use by category (pre-survey)

When the number of tools that STs used were explored by disciplinary area, PME Year 1 STs reported using a relatively small number of AI tools, with mean usage ranging from 1.75 among MFL STs, 1.87 for HE STs to 2.85 among BS STs. While BS STs appeared to use slightly more tools on average than those in MFL or HE, substantial overlap in the distributions was evident across all three subject areas. A one-way ANOVA found no statistically significant differences in the number of AI tools used across subject groups, $F(2, 79) = 0.060$, $p = .916$. These findings suggest that baseline AI tool usage was broadly similar across STs regardless of subject area.

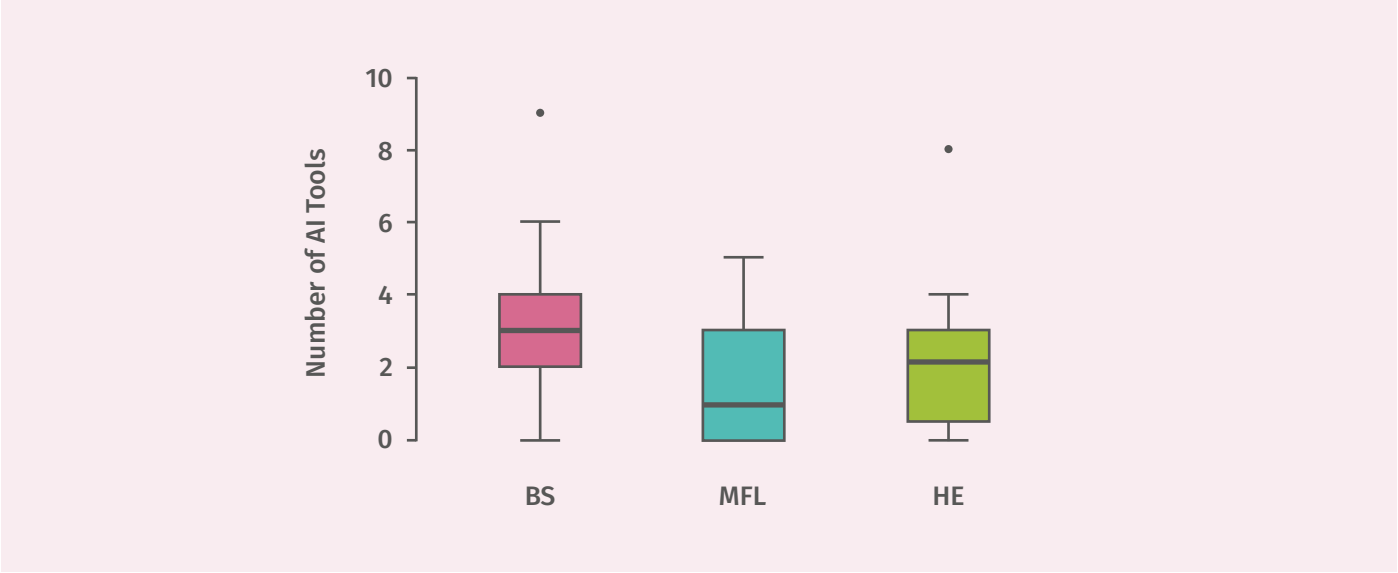


Figure 8 - Number of AI tools used by subject specialisms

The distribution of AI use across functional categories was broadly similar regardless of whether STs reported a subject as their first or second teaching subject. Across BS, HE, and MFL the largest proportion of AI use was consistently devoted to teaching materials and content creation, followed by lesson planning and teacher preparation and interactive/pupil-facing supports. Writing support, productivity-related uses, and evaluation-oriented uses accounted for comparatively small proportions of reported activity in all subject areas.

Some minor variation was evident between disciplines. MFL STs' reported slightly greater use of interactive and student-facing applications of AI, while HE STs devoted a larger proportion of their AI use to lesson planning and content creation. BS STs demonstrated a relatively balanced distribution across content creation, planning, and interactive uses. However, the profiles were highly comparable across disciplines and between first and second subject selections.

Overall, the findings indicate that participants across all three subject domains employed AI in broadly similar ways, primarily for resource creation, planning, and instructional support rather than for assessment or evaluative purposes.

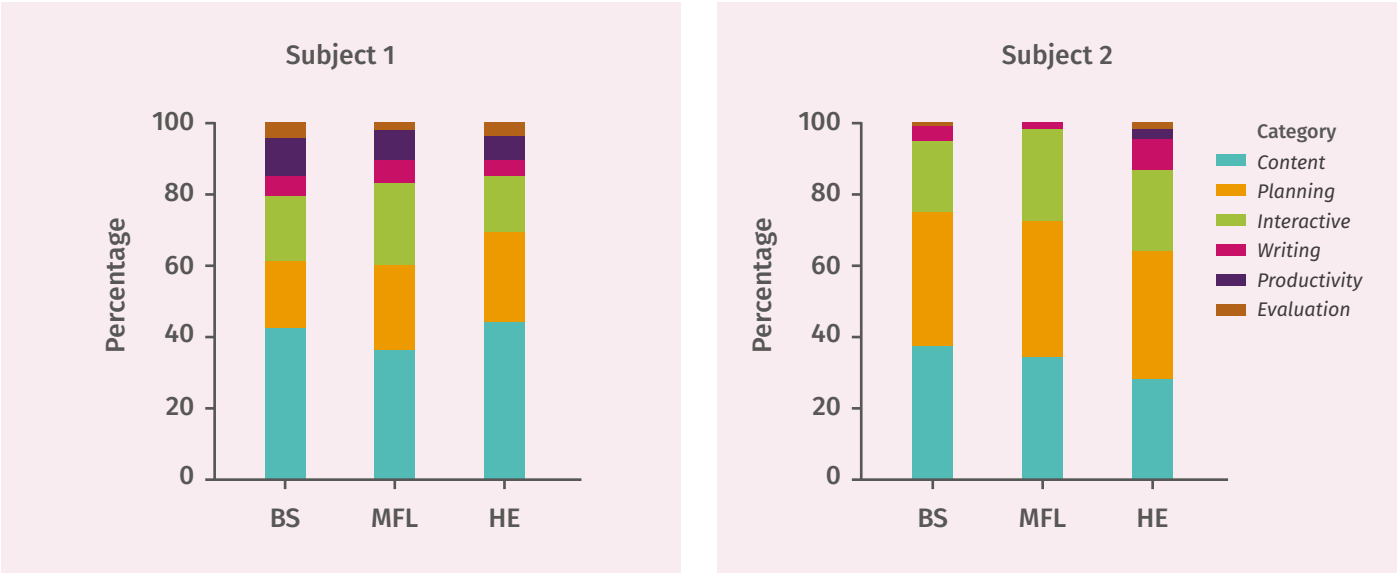


Figure 9 – Distribution of AI use by functional category and subject specialism

3.2.5 Measuring AI competence

To measure AI competence, four 5-point Likert scale items were created (1 = 'not confident at all', 5 = 'highly confident') that related to the following competences:

a. The ability to integrate AI to leverage it pedagogically (α = .84)
b. The ability to critically evaluate AI output (α = .83)
c. The ability to use AI in ethical and human-centric ways (α = .81)
d. The ability to reflect on your use of AI (α = .88)
e. The ability to question your attitudes and trust around AI (α = .83)

For each set of scales, the mean of the 4 Likert scales for each competence were calculated, which formed the basis of the composite score for each of the above areas of AI competence. Cronbach's alpha suggested that there was good to strong internal coherence of the constructs.

3.2.5.1 The ability to integrate AI to leverage it pedagogically

STs reported a higher level of confidence in their ability to integrate AI for pedagogical purposes at the end of the academic year. The mean score increased from 3.31 (SD = 0.86) in the pre-survey to 3.67 (SD = 0.78) in the post-survey, indicating a positive shift in self-reported competency. The box-and-whisker plot [Figure 10] also suggests an upward movement in the overall distribution of scores, with post-survey responses clustering at higher levels of agreement and showing slightly less variability. These findings suggest that participants felt more capable of using AI meaningfully to support teaching and learning at the end of the academic year.

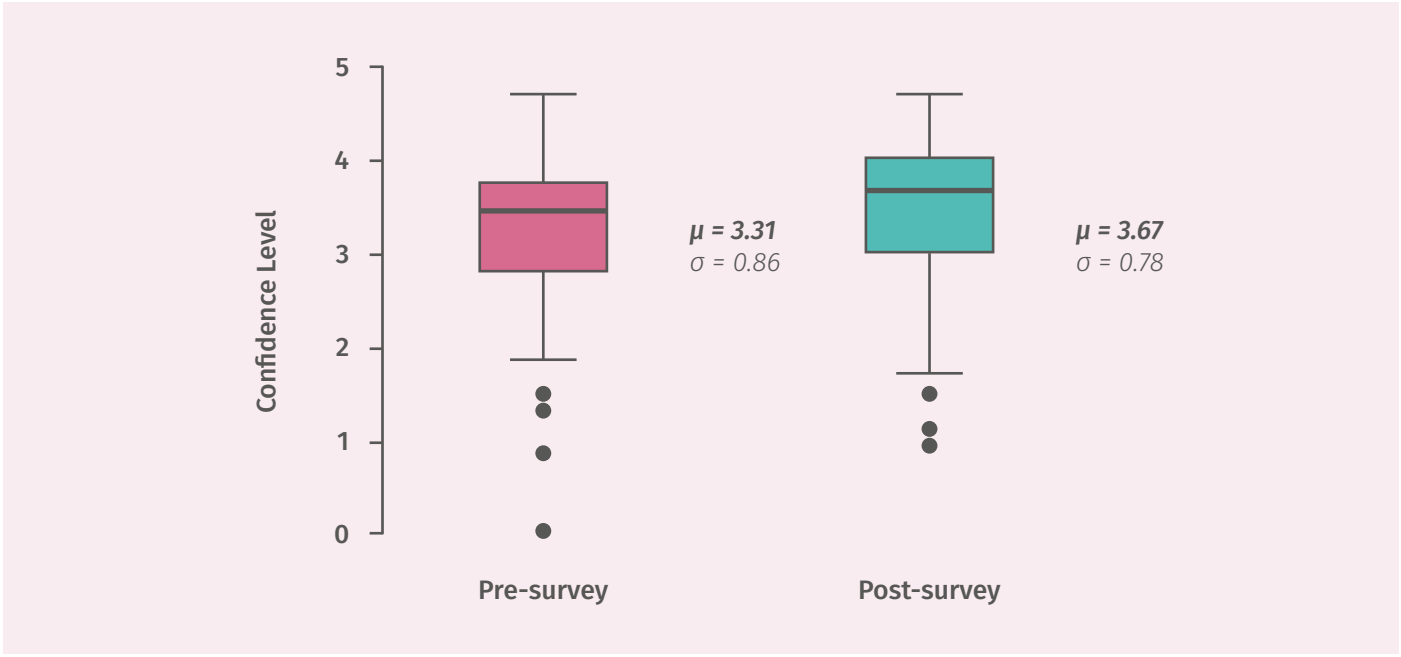


Figure 10 - Confidence in integrating AI for pedagogical purposes (pre- and post-surveys)

3.2.5.2 The ability to critically evaluate AI output

Participants reported relatively high levels of confidence in their ability to critically evaluate AI-generated outputs in both surveys. Mean scores increased slightly from 3.99 (SD = 0.60) in the pre-survey to 4.13 (SD = 0.61) in the post-survey, indicating a modest improvement in self-reported competency.

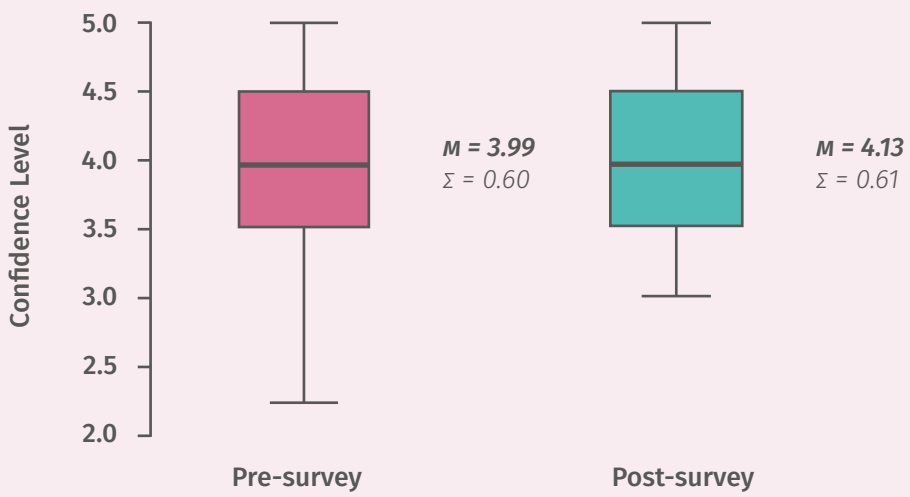


Figure 11 - Confidence in critically evaluating AI output (pre-and post-surveys)

The box-and-whisker plot [Figure 11] shows that scores were already clustered towards the upper end of the scale at baseline, suggesting limited room for substantial growth. Nevertheless, the upward shift in the median and overall distribution indicates that STs felt marginally more confident in their ability to assess the quality, accuracy and appropriateness of AI-generated content at the end of the academic year.

3.2.5.3 The ability to use AI in ethical and human-centric ways

STs reported high levels of confidence in their ability to use AI in ethical and human-centred ways in both survey samples. Mean scores increased marginally from 4.17 (SD = 0.65) in the pre-survey to 4.20 (SD = 0.67) in the post-survey, indicating little overall change.

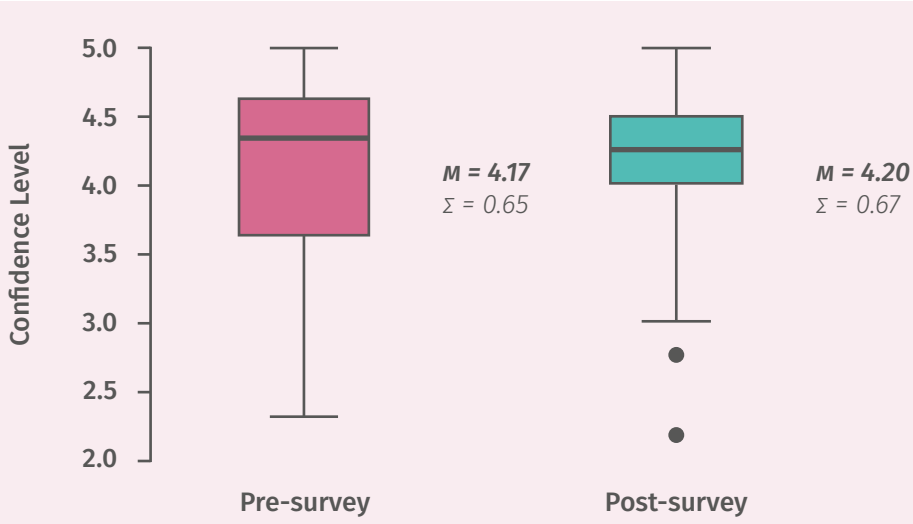


Figure 12 - Confidence in using AI in ethical and human-centred ways (pre-and post-surveys)

The box-and-whisker plot [Figure 12] illustrates that responses were already concentrated towards the upper end of the scale at baseline, suggesting a possible ceiling effect. Overall, the findings indicate that STs entered the programme with strong confidence in their ability to use AI responsibly and that this confidence was maintained throughout their year of placement.

3.2.5.4 STs' ability to reflect on their use of AI

STs' reported a modest increase in their ability to reflect on their use of AI at the end of the academic year. Mean scores increased from 2.83 (SD = 0.78) in the pre-survey to 2.99 (SD = 0.83) in the post-survey, indicating slightly greater confidence in critically considering how and why they use AI.

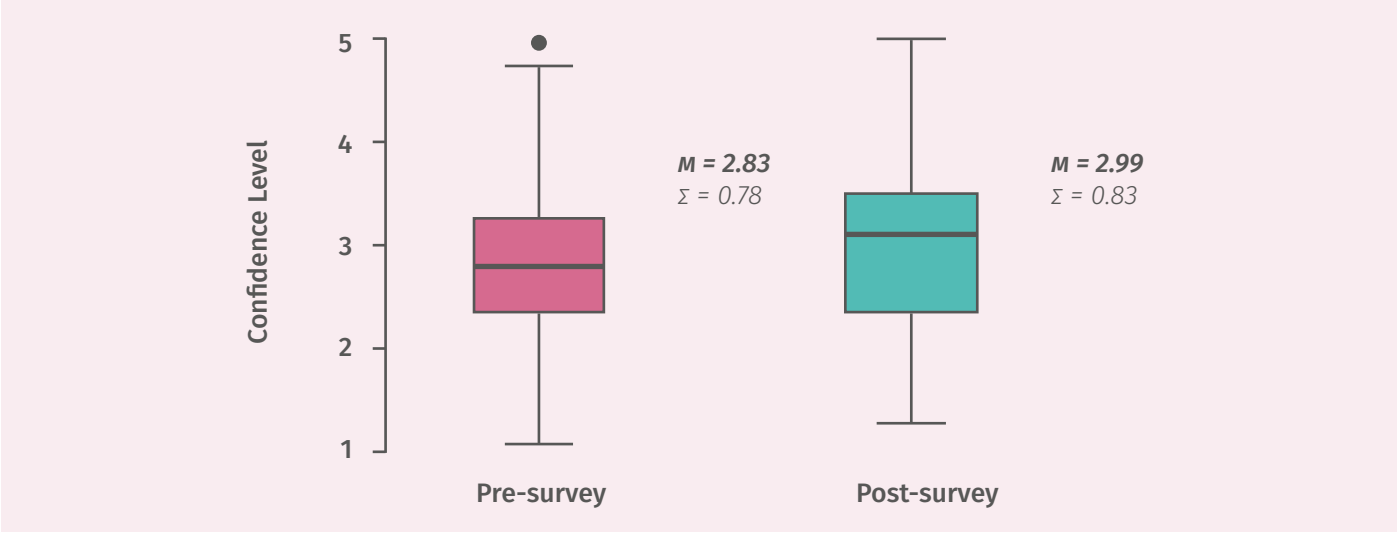


Figure 13 - Descriptive statistics for reflective AI practice (pre-and post-survey)

The box-and-whisker plot [Figure 13] suggests a small upward shift in the distribution of responses, although scores remained around the midpoint of the scale. Overall, the findings suggest some development in reflective AI practice, while also indicating that reflection remained one of the less strongly developed AI competencies within the sample.

3.2.5.5 STs' ability to question their attitudes and trust around AI

STs' reported a small increase in their ability to critically examine their attitudes towards and trust in AI at the end of placement. Mean scores rose from 3.11 (SD = 0.61) in the pre-survey to 3.21 (SD = 0.55) in the post-survey, suggesting a modest improvement in this competency.

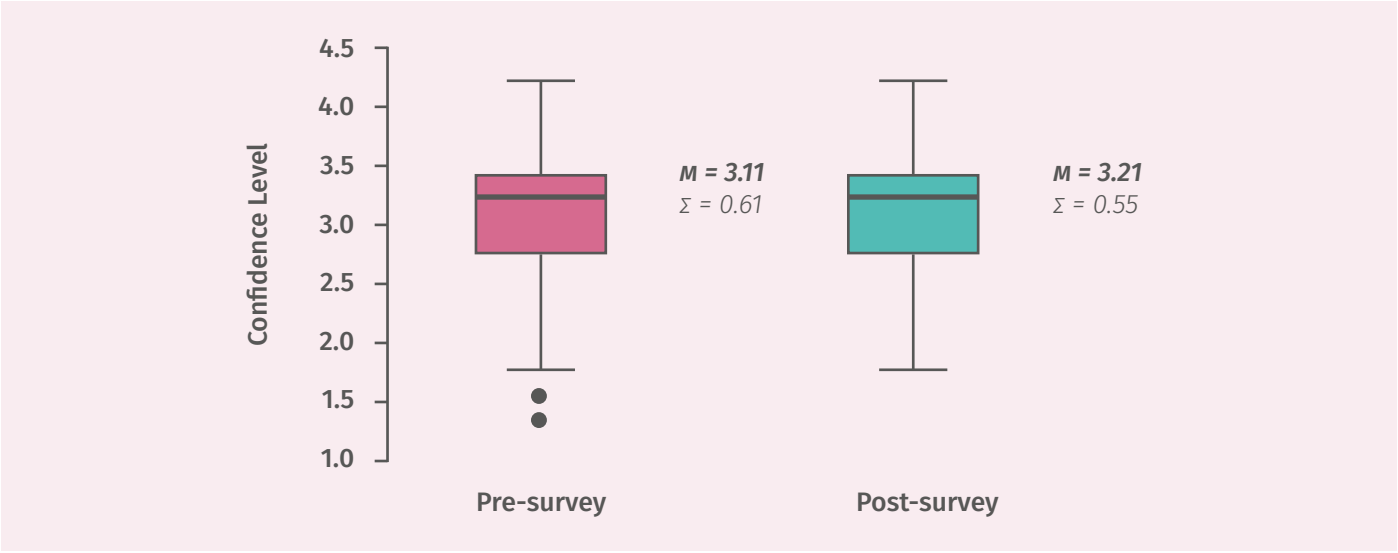


Figure 14 - Descriptive statistics for critical examination of attitudes towards and trust in AI (Pre-and post-survey)

The distribution of responses remained relatively consistent across both data points, with slightly reduced variability in the post-survey. Overall, the findings indicate a small positive shift in STs' willingness to critically consider their attitudes and levels of trust when engaging with AI technologies.

Overall, in relation to the five AI competency areas, STs' reported generally stable or slightly higher levels of self-reported competency at the end of the year compared to the beginning. The largest increase was observed in STs' ability to integrate AI pedagogically, suggesting growing confidence in applying AI within teaching and learning contexts during their practicum. Smaller increases were evident in their ability to critically evaluate AI outputs, reflect on their use of AI, and question their attitudes and trust towards AI. In contrast, confidence in the ability to use AI in ethical and human-centred ways remained consistently high across both measurement points, with only minimal change observed.

The findings suggest that STs were generally more confident in the practical application of AI than in the reflective dimensions of AI competency. While confidence in pedagogical integration increased noticeably over the course of the year, comparatively lower scores for reflection and trust indicate that STs remained less certain about how to interrogate their own use of AI. At the same time, consistently high scores for ethical and human-centred use suggest that STs viewed AI as a tool to support, rather than replace, the fundamentally human and relational nature of teaching. Taken together, the results point towards the development of practical AI competence during the year while highlighting the continued importance of fostering deeper critical and reflective engagement with AI in teacher education.

3.2.6 Intended use of AI in the future

STs' reported a generally positive disposition toward future AI use (M = 3.71, SD = 0.75), indicating a reasonably strong intention to integrate AI into their practice (1 = 'not very likely at all', 5 = 'highly likely'). When considered alongside increases in pedagogical integration, this suggests that future use is likely to be driven by practical classroom applications rather than shifts in deeper reflective or ethical positioning.

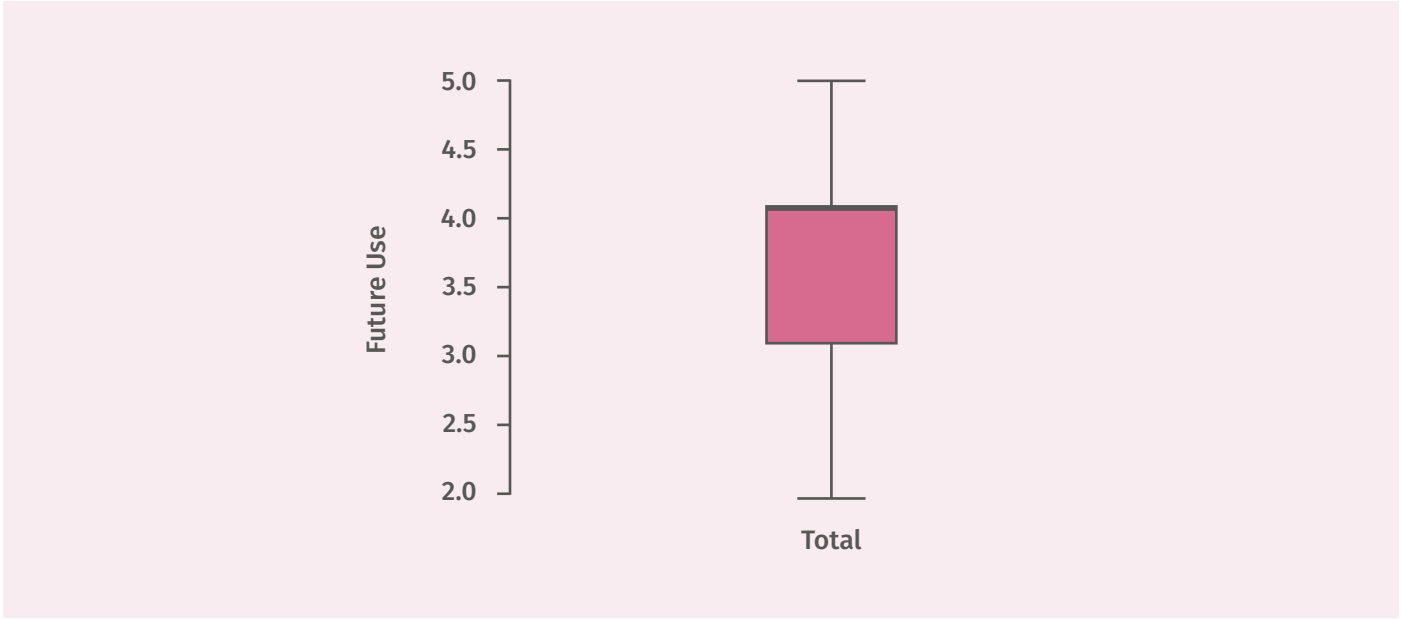


Figure 15 – STs' willingness to integrate AI into future practice

When analysed by disciplinary area (BS, HE and MFL), STs across the three subject areas anticipated moderate to high future use of AI [Figure 16].

BS STs' reported the strongest intention to use AI in the future (m = 4.20, SD = 0.68) and a relatively narrow distribution, indicating both high levels of anticipated use and greater agreement among respondents. MFL (m = 3.33, SD = 0.71) and HE (m = 3.67, SD = 0.78) STs also expressed positive intentions towards future AI use, although their mean scores were slightly lower [Figure 16] and their responses indicated somewhat greater variability. Also, for the MFL cohort, no ST expressed a strong opinion about its future use.

The overlap between the three discipline areas suggests that future intentions to use AI were broadly positive across all subject areas, with BS STs appearing marginally more enthusiastic than their peers in HE and MFL.

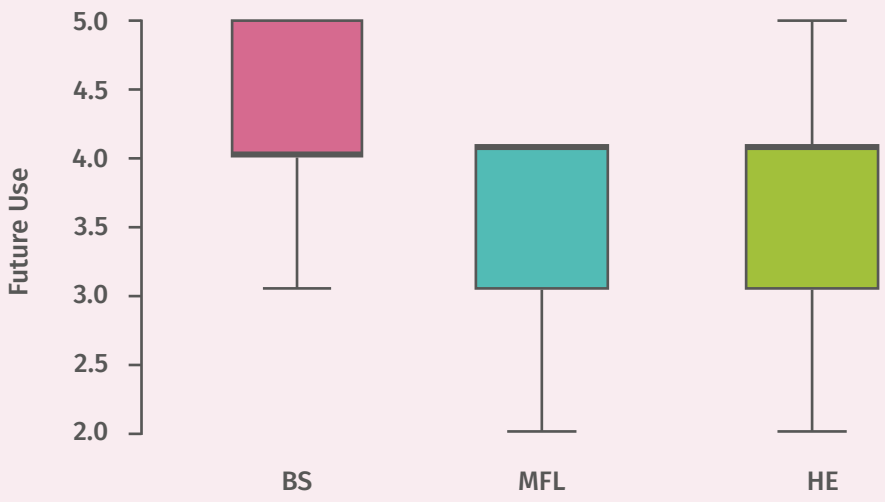


Figure 16 - Future AI use intention by subject specialism

3.3 ST focus groups

Analysis of the focus group data revealed five interconnected themes relating to STs' experiences and perceptions of AI during school placement. Collectively, these themes illuminate the complex nature of the relationships between institutional culture, professional practice, ethical decision-making and emerging AI literacies, highlighting both the opportunities and challenges associated with integrating AI into contemporary educational settings.

The first theme concerned institutional attitudes towards AI and patterns of adoption. STs described considerable variation across placement schools, with some leadership teams actively encouraging the exploration of AI tools - *'AI..., it's really encouraged in the school. Like, the principal especially wants us to be really up to date to help the students rather than, like, take over what's in the classroom'* - while others adopted a more cautious stance - *'AI isn't encouraged.'* Despite these differences, the practical use of AI by teachers was reported to be widespread, particularly for lesson planning, resource development and administrative tasks. A generational dimension was also evident, with younger teachers perceived as more willing to experiment with AI technologies - *'I feel like the older staff are a bit still like, don't be using that, do it yourself.'* STs further noted that AI has become increasingly normalised among pupils, creating tensions where school policies sought to restrict or discourage its use.

The second theme related to the applications and motivations underpinning AI use. Across all three disciplinary groups (BS, HE and MFL), AI was primarily viewed as a tool that enhanced efficiency, supported lesson preparation and facilitated pedagogical planning. STs described using AI to generate ideas, create resources, develop visual supports and assist with differentiation. Its potential to support learners with AEN and those learning EAL was frequently highlighted - *'I use it for differentiation because there's a lot of students that are EAL students in the school, so it's good to come up with, like, handy to come up with ideas on how to support the different students.'* However, there was unanimous agreement that AI-generated outputs required significant adaptation, with participants emphasising the importance of ensuring resources were appropriate to curriculum requirements and classroom contexts.

> ***'I use it for differentiation because there's a lot of students that are EAL students in the school, so it's good to come up with, like, handy to come up with ideas on how to support the different students.'***

This tenet links clearly to the third theme which centres on limitations and distrust; *'The scary part about AI is how confident it is'* - and the necessity of using professional judgement in relation to AI outputs. STs consistently expressed concerns regarding inaccuracies, hallucinations and contextual mismatches within AI generated material - *'I found a few AI hallucinations, especially with the learning outcomes, they just kind of made up their own.'* The tendency of AI to produce content grounded in non-Irish educational contexts was viewed as particularly problematic.

Consequently, AI was rarely regarded as an authoritative source of knowledge but functioned instead as a starting point for ideas that required careful verification, refinement and contextualisation by the teacher.

Ethical considerations and professional identity formed the fourth theme. STs questioned the implications of excessive reliance on AI for both teachers and pupils, expressing concerns that dependency could undermine critical reflection, creativity and authentic engagement with learning - ***'I do feel a sense of guilt when I'm using it.'*** The use of AI for assessment and personalised feedback was viewed with particular caution, as STs believed such tasks required personal and nuanced understanding of individual learners that AI systems could not replicate - *'I don't think it's ethical in relation to student feedback because you know the student in your classroom – so if you're trying to rely on AI for student feedback, then it's more of a generic response that may not be specific to that student.'* Some ethical discussions also briefly extended beyond classroom practice to encompass broader concerns relating to environmental sustainability and societal implications on the use of AI technologies.

> ***'I don't think it's ethical in relation to student feedback...[AI gives a] more of a generic response that may not be specific to that student.'***

The final theme focused on future directions and the development of AI literacies. STs identified the ability to recognise hallucinations and bias, critically evaluate outputs and construct effective prompts as essential competencies for future educators. While STs recognised the growing presence of AI within education, they remained sceptical of claims that it could replace them, consistently describing teaching as a fundamentally relational profession grounded in empathy, professional judgement and contextual understanding - *'I learned that when I had a good relationship with my teacher, a good relationship with my class environment, I learned a lot better'.*

While these themes were evident across all three disciplinary groups, several noteworthy differences emerged. MFL STs expressed particular concern regarding language acquisition, translation tools and the challenge of distinguishing authentic student work from AI-generated responses. HE STs placed greater emphasis on the potential of AI to support inclusive practice and differentiation, particularly for students with AEN and EAL learners. BS STs focused more strongly on contextual appropriateness and the practical challenges associated with adapting generic AI outputs for diverse classroom settings. Despite these differences, STs across the three disciplines shared a common understanding that AI functions most effectively as a support mechanism rather than as a replacement for professional expertise. Effective AI use was consistently framed as dependent on the knowledge, judgement and contextual awareness of the teacher, reinforcing the importance of human agency within an increasingly AI-mediated educational landscape.

3.4 AI-integrated assignments: reflections across the disciplines

Analysis of the semester 1 reflective component of the assignments completed by PME Year 1 STs in BS, HE and MFL revealed three recurring themes regarding the use of AI in lesson planning: efficiency and idea generation; the importance of professional judgement and contextualisation; and concerns relating to accuracy, ethics and overreliance. Although these themes were evident across all three disciplines, differences reflected the distinctive pedagogical priorities and practices associated with each subject area.

Efficiency and idea generation
Across the three datasets, STs consistently positioned AI as a useful starting point that enhanced planning efficiency and supported creativity. HE STs noted that AI *'provided a clear structure and comprehensive sequencing of a practical cookery lesson' and 'reduced the initial workload associated with lesson planning.'* Similarly, BS STs described how AI *'provided a clear and logical sequence of learning activities'* and supported the efficient organisation of ideas. MFL STs also viewed AI as *'a useful, supportive tool',* with one student highlighting how ChatGPT generated *'24 different versions'* of role-play cards within a matter of minutes. Collectively, these reflections suggest that STs positioned AI as a supportive tool that enabled them to work more efficiently, generate creative ideas and develop resources that could subsequently be adapted to meet the needs of their learners and classroom contexts.

Professional judgement and contextualisation
While recognising the benefits of AI, STs across the three disciplines also emphasised that AI-generated outputs required considerable adaptation before they could be implemented in practice. HE STs argued that *'AI lesson plans*

need to be critically evaluated from a professional point of view rather than used as it's first produced.' Similarly, BS STs observed that ***'effective teaching depends on responsiveness to learners, resources, and classroom context - factors that AI cannot fully account for.'*** MFL ST reflections echoed this sentiment, with one participant noting that AI *'cannot replace professional judgment, reflection, or sensitivity to learners' needs.'* Across the three subject areas, meaningful lesson planning was consistently framed as dependent upon teacher expertise, knowledge of their subject curriculum, knowledge of their learners and professional judgement rather than technological capability alone.

Accuracy, ethics and overreliance

STs also expressed concerns regarding the reliability and ethical implications of AI use. HE STs highlighted that *'information provided by AI was not always accurate'* and noted that ethical concerns emerge because *'the information is not your own.'* BS STs cautioned that excessive dependence on AI may *'reduce my capability as a teacher'*, while MFL STs warned that overreliance risks bypassing *'critical thinking processes central to education like planning and reflection.'* Although STs generally viewed AI positively, they consistently emphasised the need for critical engagement and responsible use.

> ***'information provided by AI was not always accurate [because] the information is not your own.'***

While these themes were common across the disciplines, differences were evident. HE STs' reflections focused more strongly on practical considerations such as safety, pacing and skill development. BS STs emphasised curriculum alignment, assessment and differentiation, whereas MFL STs were particularly concerned with communicative competence, target language use and the accuracy of linguistic content. Taken together, the findings suggest that although STs shared broadly similar perceptions of AI, the ways in which its affordances and limitations were understood remained anchored firmly within and shaped by the distinctive pedagogical demands of individual subject areas.

3.5 ST stimulated recall

The stimulated recall sessions utilised STs' semester 1 assignments as prompts to explore the thinking underpinning their engagement with AI in lesson planning. Across BS, HE and MFL, three interconnected themes emerged relating to the growing normalisation of AI as a professional support tool, the continuing importance of teacher expertise and contextual knowledge, and tensions encompassing dependence, confidence and professional identity.

Across the three disciplines, STs consistently positioned AI as a tool that enhanced efficiency and supported idea generation rather than as a replacement for lesson planning. HE STs frequently referred to AI as a *'time saving'* mechanism and acknowledged that *'it gives some great … ideas'* for homework, questioning and classroom activities. BS STs similarly described AI as facilitating *'idea generation'* and providing *'a blank canvas'* from which lessons could subsequently be developed. MFL STs highlighted ***the usefulness of AI in supporting the 'grunt work'*** associated with lesson planning and administrative tasks. Although several STs described initial reservations regarding AI use, repeated engagement and positive experiences had contributed to its gradual integration into everyday planning practices. Collectively, these reflections suggest that STs viewed AI as a supportive tool that maximised efficiency and facilitated resource development while still requiring professional adaptation and refinement.

However, STs consistently emphasised the limitations of AI-generated outputs and the enduring importance of teacher expertise. HE STs stressed that AI *'doesn't know your class, it doesn't know your students'* and therefore lacked the capacity to judge pace, ability levels and prior learning. BS STs similarly argued that effective prompting depended upon teacher expertise and that AI could not replicate *'emotional intelligence'* or knowledge of their pupils' interests and relationships. MFL STs highlighted the limitations of AI in producing target language activities that reflected communicative language teaching principles and classroom realities. Across these subject disciplines, STs positioned themselves as the *'final arbiter'*, responsible for evaluating, adapting and refining AI outputs. These findings reinforce the view that effective AI use remains dependent upon professional judgement and contextual awareness rather than technological capability alone.

Alongside recognition of AI's benefits, STs expressed varying degrees of ambivalence regarding its growing presence within professional practice. MFL STs were particularly concerned that increased reliance on AI might undermine

confidence, with one participant admitting that ***'the more I use it, I feel like the less confident I'm becoming.'*** BS STs similarly emphasised that AI could not replace the complexity and relational dimensions of teaching. HE STs appeared more accepting of AI as a routine aspect of practice, with one participant arguing that *'you'd actually be stupid not to use it'* because of the time it saved.

While the three disciplinary groups shared many common understandings, again differences emerged. Within the bounded context of the stimulated recall activity, HE STs demonstrated the greatest acceptance of AI and appeared to view it as an established component of everyday practice. BS STs focused more strongly on teacher expertise, emotional intelligence and professional judgement, whereas MFL STs expressed the strongest reservations, particularly regarding linguistic accuracy, communicative language teaching and the implications of AI use for confidence and professional identity. Collectively, these findings suggest that attitudes towards AI are shaped not only by individual beliefs and experiences but also by the distinctive pedagogical priorities and epistemologies that characterise individual subject disciplines.

3.6 PME educator focus groups

Two focus groups with PME educators and school placement tutors explored educators' perspectives on AI's role in ST development. Participants reviewed stimulated recall transcripts beforehand to familiarise themselves with STs' experiences and reflections on using AI for lesson planning and preparation. Analysis of the focus group data revealed three closely connected themes relating to participants' perceptions of AI within PME and school placement contexts.

AI as a useful but limited support tool

Across both focus groups, participants generally positioned **AI as a supportive tool that could enhance efficiency, generate ideas and assist with resource development, rather than as a transformative technology** capable of replacing professional practice. AI was described as useful in overcoming the challenge of the 'blank page', generating activities, creating visual resources and supporting Assessment for Learning (AfL) strategies. Participants also acknowledged its potential to reduce aspects of workload associated with planning and preparation. However, this perceived usefulness was consistently qualified. Participants described AI as 'supportive but limited' and viewed it primarily as a starting point that could help build confidence and stimulate thinking rather than as a substitute for lesson planning. Across both groups, there was broad agreement that AI could accelerate aspects of preparation, but only where outputs were subject to critical evaluation, adaptation and refinement by the teacher.

Professional judgement, context and relational teaching remain central

A dominant finding across both datasets was the **continuing importance of teacher expertise, contextual knowledge and professional judgement.** Participants repeatedly highlighted that AI has no understanding of the specific class group, individual learners, school context or the relational dimensions of teaching and learning. Concerns were raised regarding generic and overly prescriptive lesson plans, inaccurate learning outcomes, Americanised examples, poor pacing, insufficient differentiation and misalignment with curriculum specifications. Consequently, participants consistently framed effective AI use as dependent upon the ST's ability to critically evaluate outputs and adapt them in ways that reflected the needs, abilities and experiences of the students in front of them. The findings suggest that participants viewed AI not as a replacement for professional expertise, but as a tool whose value is ultimately determined by the pedagogical knowledge and contextual awareness of the ST.

AI literacy, ethical use and structured guidance within ITE

Participants in both groups emphasised **the need for explicit support within ITE programmes to facilitate the ethical and professional use of AI.** Discussions highlighted the importance of developing competencies relating to prompt construction, critical digital literacy, transparency and appropriate professional boundaries. Participants expressed concern regarding hidden or undeclared AI use, excessive reliance on AI-generated outputs and the potential for cognitive offloading, particularly where STs lacked confidence in their content knowledge or pedagogical decision-making. At the same time, structured AI-related tasks and the use of declarations were viewed positively, as they encouraged openness, facilitated reflection and provided opportunities for meaningful discussion regarding appropriate AI use. Collectively, these findings suggest that AI literacy extends beyond technical competence and encompasses the critical, ethical and professional dispositions required to engage responsibly with AI within educational settings.

Final reflections

Taken together, **the findings reveal a cautiously positive orientation towards AI.** Participants broadly accepted that AI is increasingly embedded within educational practice and, as several acknowledged, is *'here to stay'*. However, this acceptance was consistently accompanied by the view that AI must be mediated through professional judgement, subject expertise and ethical practice. Two interesting observations also emerged from the data. Firstly, participants suggested that stimulated recall activities may present a more reflective and responsible account of AI use than is always evident in practice, noting examples of undeclared, uncritical or inaccurate AI-generated work. Secondly, participants highlighted disciplinary variation, particularly within MFL, where STs appeared more critical of AI outputs, likely reflecting heightened sensitivity to language accuracy and authentic communication. A further, albeit less common perspective emerged from reports of at least one ST who chose not to engage with AI at all due to previous workplace-related experience. While this contrasted with the broader pattern of widespread adoption, it serves as a reminder that engagement with AI remains shaped by individual experiences, beliefs and professional identities.

3.7 PME Tutor surveys

PME tutors were invited to take part in a survey at the beginning (n = 8) and end of the academic year (n = 9) to examine their observations of STs' AI usage as well as their own use of AI as part of their tutoring practice. It should be noted that the number of PME tutor participants was very low in both surveys and should not be considered representative. Nonetheless, some of the most pertinent findings that provide some insights into the university-based tutor perspective have been included.

3.7.1 Use of AI within their PME tutoring practice

The initial survey showed that **AI was already present in tutors' professional practice.** Five of the PME tutors reported using AI tools in their professional work, and three had already incorporated AI into tutorials on multiple occasions. None of the PME Tutors reported having no engagement with AI.

ChatGPT and Microsoft Copilot were the most commonly used AI tools by PME Tutors (n = 2). Individual PME Tutors reported using other tools including Grammarly, Canva AI, QuillBot, LessonPlans.ai, MagicSchool.ai, Quizlet Q-Chat and Otter.ai. These findings suggest that tutors may be using common AI-based tools as part of their practice but not a particularly wide range.

3.7.2 PME Tutors' attitudes towards AI in intial teacher education

Tutors who participated generally held positive but measured attitudes towards AI. All participants agreed that AI tools can support effective lesson planning to a degree (n = 8) and some believed that it could be useful to support greater inclusion in classrooms (n = 5). However, some participants felt insecure in assessing AI output (n = 4) despite the fact that all participants felt that they had a very good or good understanding (n = 8) of the ethical implications of AI and of the biases and limitations of AI systems (n = 7). Areas where there were a variety of views related to the impact that AI-based technologies may have on STs' ability to think critically as well as their cognitive development as a teacher. Consequently, a majority of participants (n = 5) expressed a desire for further training.

3.7.3 Tutors' perceived role in supporting STs' AI use

The open-ended responses revealed **consensus regarding the role of teacher educators in an era of AI.** Three recurring themes emerged. First, tutors emphasised the importance of developing STs' capacity for critical evaluation of AI-generated outputs. Several respondents highlighted the need to ensure that STs could interrogate, adapt and critically assess AI-generated content rather than accept it uncritically. One tutor described their role as helping STs to become *'critical consumers of AI'* while another emphasised the importance of supporting STs to ***'critically evaluate the quality and appropriateness of AI-generated content.'***

Secondly, respondents highlighted the need to support ethical and responsible AI use. Ethical considerations featured prominently throughout the responses, with tutors expressing concern that STs should understand both the opportunities and limitations of AI. One respondent noted the importance of *'using AI responsibly and ethically'*, while another highlighted the need for students to recognise *'issues around bias, privacy and reliability'*.

Thirdly, many described AI literacy development as an important component of teacher education. Respondents viewed AI literacy as extending beyond technical competence to encompass professional judgement, critical reflection and pedagogical decision-making. One tutor argued that teacher educators have a role in *'developing the pedagogical, technical and ethical dimensions of [STs'] practice to ensure that they are able to keep apace of developments in the future.'*

Across responses, tutors consistently framed AI as a tool requiring human judgement rather than a substitute for professional expertise. This perspective was evident in responses describing AI as something that should support rather than replace professional decision-making. For example, one respondent argued that STs needed to understand ***'when AI can enhance teaching and when professional judgement must take precedence.'*** Similarly, another respondent stressed the importance of ensuring that AI was used *'as a support tool rather than a replacement for thinking.'*

The emphasis placed on critical evaluation, ethical awareness and pedagogical decision-making suggests that respondents viewed AI competence as extending beyond technical proficiency to encompass reflective and responsible professional practice.

3.7.4 PME tutors' perspectives on AI use by STs across the academic year

A small number of PME tutors (n = 9) responded to a second survey at the end of the academic year in which they were invited to report on their observations of AI usage by STs throughout the year. Again, the data analysis below should not be considered representative but does provide some insight into the PME tutor perspective.

According to PME tutors, AI had become a visible feature of many STs' professional practice. Some PME tutors reported that AI use was present but did not change (n = 4), while others (n = 5) reported increased use varying from slight to significant.

ChatGPT emerged as the dominant AI platform. All tutors (n = 9) reported that STs had used or demonstrated the use of ChatGPT during the year, which aligns with reported ST usage. Microsoft Copilot was observed by a small number of tutors (n =4) as well as Canva AI (n = 3). Other tools, including Google Gemini, Claude, Grammarly, LessonPlans.ai, MagicSchool.ai, Quizlet Q-Chat and Otter.ai, were also sporadically reported.

In terms of usage, PME tutors most commonly observed AI being used for classroom-based purposes. Half of respondents (n = 3) identified the creation of assessments as a common use of AI. Other uses (e.g. writing weekly reflections [n = 1], identifying online resources [n = 1], and analysing curriculum or policy documents [n = 1]) were also cited.

The qualitative responses reinforced this pattern. Tutors consistently described AI as supporting idea generation, lesson preparation and resource development. One respondent noted that STs used AI *'to come up with interesting hooks to their classes.'* Another highlighted its value *'to provide resources and creative ideas to build student centred lessons and support teaching pedagogy.'* Similarly, tutors described AI as supporting the *'creation of resources'* and *'researching links to learning.'*

Overall, these responses suggest that STs primarily used AI as a planning and preparation tool rather than as a substitute for teaching itself.

3.7.5 PME Tutors' concerns at the end of the academic year

When asked about concerns that PME Tutors' had at the end of the academic year having supported their STs throughout the placement period, one tutor highlighted that STs have a *'lack of critical thinking'* and *'students believe that AI is totally reliable as a source.'* Another respondent expressed concern that AI-generated outputs were not always sufficiently contextualised - ***'I saw one example of a worksheet which was very 'Americanised' instead of being 'Mallowised' in its wording.'***

While one tutor also reported that AI use can be useful to help STs to develop *'clarity of vision'* for planning and pedagogical reflection, others reported more concerns in relation to overreliance. For instance, when responding to the statement *'I saw instances of overreliance on AI'*, over half (n = 5) cited this as a moderate or significant concern.

One PME tutor voiced their concern by saying that overreliance *'...would dilute teacher delivery of teaching and learning in the classroom.'* Another noted concerns regarding the use of AI in reflective writing: *'the language used seemed a little detached from the personal, reflective stance I would be used to.'* Such comments suggest that tutors were particularly concerned when AI appeared to replace rather than support professional thinking and reflection.

3.7.6 Further training and development is required for STs

The strongest quantitative finding in the end of year survey concerned the perceived need for ongoing support in the responsible use of AI. When responding to the statement 'my students still need more structured training on responsible AI use', over half of participants (n = 5) agreed or strongly agreed that this is the case.

The qualitative responses reinforced this finding. Rather than calling for greater access to AI tools, respondents emphasised the need for stronger foundations in AI literacy, ethical awareness and responsible professional practice. Recommendations included the development of:

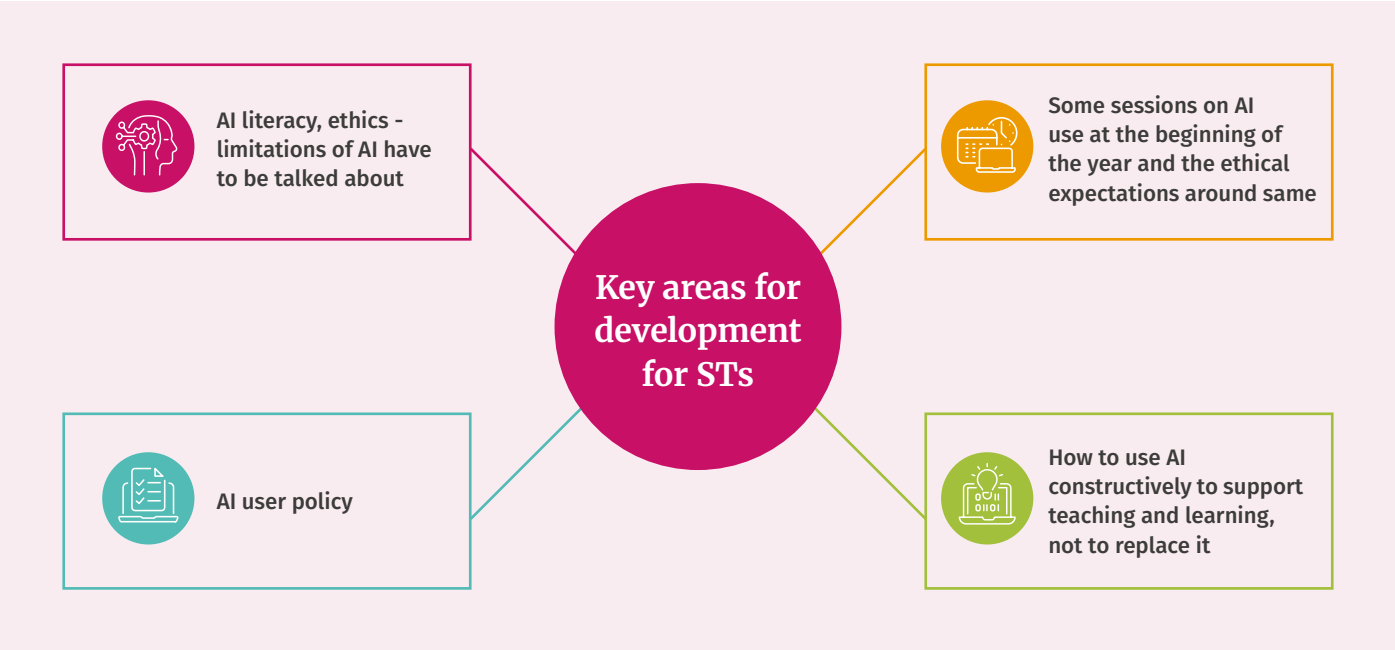


Figure 17 Recommendations made by PME tutors

Importantly, respondents viewed these supports as relevant not only for STs but also for tutors themselves. One participant explicitly noted that: *'both students and tutors need training on how AI might be used in an acceptable manner.'* One respondent also noted that they intended *'upskilling myself and trying to learn a little more about Gen AI so that I will be able to talk about it more competently with my students.'* This suggests that, despite increasing familiarity with AI throughout the year, PME Tutors continued to view responsible AI use as an area requiring explicit guidance and ongoing professional learning. One tutor, in fact, stated that: *'I will still insist on measured, controlled use of AI tools.'*

3.8 Hackathon

The findings presented in this section are organised around the four aims that guided the Hackathon event [Figure 2]. Through collaborative discussion and co-design activities, participants (n=10) explored how AI could support professional learning and dialogue within teacher education partnerships. These findings provide insight into participants' perspectives on the potential role of AI in strengthening mentoring, reflection and collaboration within ST-CT partnerships.

Photos of the Hackathon 2026 event

3.8.1 Key features of high-quality professional meetings between CTs and STs

Hackathon participants identified several interconnected features that underpin high-quality professional meetings between CTs and STs. **Trust** emerged as the most prominent characteristic, underpinning honest dialogue, mutual respect, empathy and the development of a comfortable, safe space in which both parties could discuss successes and challenges openly. Participants emphasised that meetings should be characterised by **'dialogue rather than monologue',** with CTs and STs acting as active listeners who engage in shared reflection rather than one-way feedback.

A second key finding related to the **structured and developmental nature of meetings.** Participants highlighted the importance of meetings being *'structured, organised and regular'*, incorporating goal setting, reflection on lesson observations, discussion of samples of pupils' work, and where appropriate, keeping brief records of agreed actions. Support was viewed as something that should evolve throughout the placement, reflecting the ST's growing competence and changing needs.

Finally, participants stressed that effective meetings are grounded in a shared commitment to professional learning. CTs were seen as **modelling practice** through practical demonstrations while also remaining open to learning from STs, reflecting a culture of reciprocal professional growth. **Meetings should balance constructive feedback,** they should *'lead with the positives'*, with recognition of strengths, maintain realistic expectations and keep pupils' learning at the centre of discussions: *'students are at the heart of everything we do.'* Shared resources, shared experiences and open communication were viewed as essential mechanisms for fostering collaborative relationships that support both professional development and improved teaching practice.

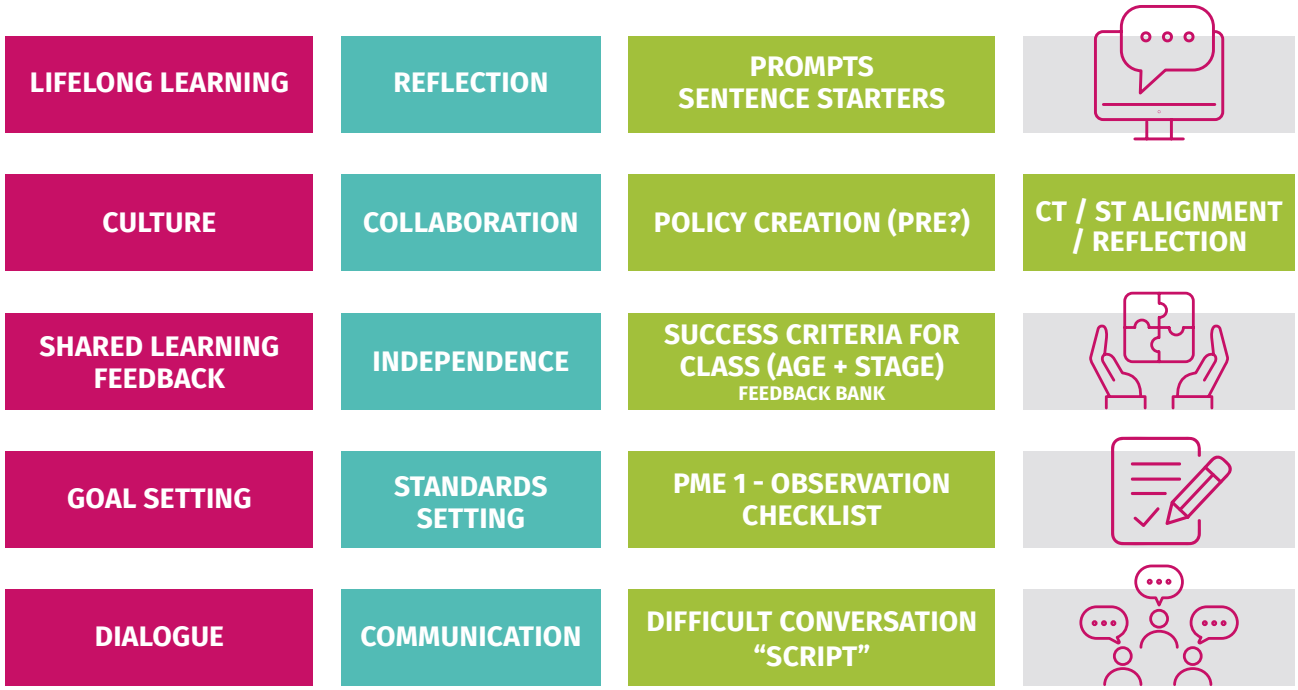
Figure 17 - Hackathon participants' perceptions of high-quality professional meetings between CTs and STs

3.8.2 How AI can enhance professional dialogue and reflective conversations between CTs and STs

Participants identified recurring features of high-quality CT-ST professional dialogue, with a strong emphasis on **collaboration, balance and reflective exchange.** These features focused on shifting from directive to dialogic mentoring, supporting constructive feedback, shared goal setting and the development of a supportive professional learning culture during school placement.

The identified features were consistently linked to core professional competencies, including reflective practice, collaborative capability, communication, organisation and pedagogical reasoning. Participants highlighted how effective CT-ST interactions can support both relational and cognitive aspects of professional learning, particularly in developing adaptive expertise and confidence during school placement.

AI was primarily positioned as a tool to enhance the structure and quality of CT-ST dialogue [Figure 18]. Participants suggested uses such as generating prompts, supporting feedback language, creating rubrics and observation tools and analysing lesson plans. Overall, AI was viewed as a supportive scaffold for enhancing the depth and focus of CT-ST dialogue.



Key – Pink Post-Its (Professional Dialogue Features), Blue Post-Its (Competencies) and Green Post-Its (AI Support)

Figure 18 - Linking professional dialogue features to competencies and AI support

3.8.3 AI-informed protocols to support interactions between CTs and STs

Four AI-informed protocols were co-designed by Hackathon participants to support structured interactions between CTs and STs. The protocols were intended to provide practical, repeatable approaches for enhancing dialogue, reflection and the development of core competencies during school placement.

The first protocol [Appendix 1] focused on using AI to compare and contrast CT and ST lesson plans to support more dialogic discussion of teaching approaches. The second [Appendix 2] involved generating and analysing units of learning, enabling more realistic and contextualised planning and breakdown of teaching sequences. The third protocol [Appendix 3] used AI to interpret and differentiate classroom tasks to prompt discussion of pedagogical decisions. The final protocol was concerned with developing mutual understanding of classroom and whole school policies using AI to prompt reflection for the ST to enable in-depth conversation with their CT [Appendix 4].

Participants found the activity highly engaging and expressed satisfaction with the potential of AI to support CT-ST interactions and professional dialogue. Their responses reflected genuine enthusiasm for the AI-supported protocols, describing the outputs as *'incredible'*, *'one of the most impressive things I've seen all afternoon'*, and *'that's such a nice idea.'* However, they also emphasised the importance of professional judgement in interpreting AI outputs. As one participant noted, *'the student teacher can do all of this (AI support application), but won't necessarily have the experience or knowledge to know whether this is right or not and that's where the failsafe, I suppose, is the cooperating teacher.'* This highlights the perceived necessity of the CT as an essential interpretive guide within AI-supported practice.

Overall, AI was consistently positioned as an **enabling tool rather than a replacement for professional expertise.** As another participant explained, *'in all of these things that we've discussed, we're definitely seeing AI as a tool... it can support and enhance what we do, but it doesn't replace what we do.'* This sentiment reinforces the view that AI's value lies in augmenting, rather than substituting, professional judgement and relational mentoring processes.

3.8.4 The opportunities and barriers associated with integrating AI into these professional learning processes

Participants identified both significant opportunities and important challenges associated with integrating AI into professional learning processes during school placement. The perceived benefits centred on AI's capacity to improve efficiency and enhance, rather than replace, existing teaching and mentoring practices. Participants described AI as a means of *'working smarter'*, saving time on planning and resource creation, generating images and visual supports and simulating teaching scenarios that could enrich professional dialogue. AI was also valued for its perceived impartiality when comparing CT and ST lesson plans, providing a neutral starting point for discussion and reflection. Participants highlighted its potential to reduce workload and support wellbeing, with one noting that *'it really helps with student teacher burnout and teacher burnout in general'*, while another commented simply that *'it just gives you more time to teach.'*

Despite these advantages, participants expressed several concerns regarding AI integration. Fear of AI, limited confidence in its use and the need for targeted professional learning were identified as key barriers. Participants also questioned the reliability and contextual relevance of AI-generated outputs, noting that responses could be overly *'Americanised'* or fail to reflect the realities of local school contexts. Most importantly, there was strong consensus that AI outputs require careful professional scrutiny. As one participant explained, ***'you still have to do the hard bit... so that you develop that experience of criticality so that when you look at AI, you know that doesn't work.'*** This reflects a shared view that, while AI can enhance professional learning, it cannot replace the professional expertise, contextual understanding and critical judgement that develop through experience in the classroom.

3.9 Summary

- **AI is already normalised in ST practice** during the practicum element of the PME, especially for planning, resource creation, idea generation, differentiation and workload support.
- Across all datasets, **STs and tutors refer to AI as a support tool,** not a replacement for professional judgement, with repeated emphasis on contextualisation, curriculum alignment, learner knowledge, relational teaching and teacher expertise.
- However, while AI may not replace professional judgement, **greater support and professional learning are needed to enable STs to use AI critically for reflection,** develop trust in its appropriate use, and recognise the point at which reliance on AI may compromise professional judgement.
- There was **strong convergence** between STs and teacher educators in their views on the **responsible integration of AI,** particularly regarding the need for AI literacy, ethical use, structured guidance, declarations/transparency and professional boundaries.
- **Disciplinary variation matters,** with MFL STs more cautious around linguistic accuracy/authentic communication, HE STs were more focused on inclusion/practical adaptation and BS STs more focused on contextual fit, planning and curriculum relevance.

Chapter 4 Integration of findings and discussion

4.1 What are students using AI for as part of their school placement?

STs used AI during school placement primarily as a practical support for planning, preparation and resource development. Across the different data sources, AI was not generally positioned as a replacement for teaching or professional judgement. Instead, it was used to reduce the initial burden associated with planning, generate possible ideas and help STs move beyond the 'blank page' when developing lessons and resources. Its use was, therefore, concentrated most strongly in the planning and preparation stages of teaching, including brainstorming, worksheet development, text adaptation, lesson sequencing and differentiation. These findings, particularly related to time-saving, are corroborated in previous practicum-based research (Doğan, 2026; Aldım *et al*., 2025; Lee & Ahn, 2021)

By contrast, AI appeared to play a more limited role in activities involving assessment, reflective writing, responding to tutor feedback, analysing placement data or evaluating student work. This pattern may indicate that STs were more cautious about using AI for such activities, despite the fact that research where AI has been deliberately used, for example for reflection, can be beneficial to ST development if scaffolded appropriately (Erbay-Cetinkaya, 2026; L'Enfant, 2024). The use of AI at this point in their initial professional development may also point to their emerging priorities at their current career stage. However, the less frequent use of AI for assessment and reflection should not be taken as evidence that cognitive offloading did not occur. Planning is itself an important process through which STs develop pedagogical reasoning, curricular knowledge and professional judgement. Consequently, the use of AI to support planning may be productive where it generates possibilities for STs to evaluate, but more problematic where it removes the need for them to undertake this thinking themselves.

The dominance of general-purpose platforms, such as ChatGPT, provides further insight into the nature of STs' engagement with AI. The latter was cited as the most visible tool across the year, along with, to a lesser extent, Microsoft Copilot and Canva AI. More specialist AI-based educational tools were considerably less prominent. Also, it is important to point out that many of these tools also sit behind a paywall, which may dissuade STs from using them. This suggests that STs' practices may be shaped by issues related to accessibility, visibility and flexibility. However, one of the pitfalls of using these more generalist AI tools is their nature seems to also increase the need for outputs to be checked for curricular alignment or inappropriateness (Debreli, 2026; Kalenda *et al*., 2025). The practical benefits of these tools are, therefore, closely connected to the capacity of STs to evaluate and contextualise what they generated.

Although this broadly practical orientation was evident across all three disciplines, the particular purposes for which AI was used were mediated by subject-specific pedagogical concerns. HE STs tended to connect AI use with planning, differentiation, safety, pacing, skill development and support for AEN and EAL learners. BS STs focused more strongly on sequencing, curriculum alignment, assessment and the adaptation of generic outputs to local classroom contexts. MFL STs were more cautious, particularly where AI use raised questions about linguistic accuracy, translation, communicative competence and the authenticity of student-produced language.

These disciplinary differences suggest that AI was not simply being adopted as a generic teaching tool. Rather, its perceived usefulness and associated risks were interpreted through the forms of knowledge, classroom interaction and assessment valued within each subject. For example, concerns about physical safety and the practical suitability of activities were especially relevant in HE, whereas questions of linguistic authenticity and communicative production were particularly significant in MFL. STs' uses of AI were therefore shaped not only by what the technology could generate, but also by their developing understanding of what constituted appropriate teaching and learning within their disciplines. This discipline-specific lens is an area of AI research in ITE that requires further scrutiny and examination to explore whether AI literacies, knowledge or AI applications to classroom practices differ according to subject area.

4.2 Why are STs using AI as part of their school placement?

STs appeared to use AI during school placement for a combination of practical, pedagogical and professional reasons. At the most immediate level, AI helped them manage the considerable workload and cognitive demands associated with placement, as is also observed in other research in the field (Aldım *et al*., 2025; Zheng *et al*., 2024).

Planning lessons, locating and developing resources, adapting materials and responding to diverse learner needs all require substantial time, particularly for STs who are still developing confidence in their pedagogical and curricular decision-making skills. AI was therefore valued not simply because it could complete tasks more quickly but because it could reduce the difficulty of beginning them by providing an initial structure or idea from which STs could develop their own work.

This distinction is important because the perceived benefit of AI was not always that it eliminated workload but rather redistributed it. STs could generate, for example, an initial lesson sequence more quickly, but there still remained a requirement to evaluate its accuracy, suitability and alignment with the curriculum and the needs of their particular class. In some cases, the need to check, correct and contextualise AI-generated outputs may have created additional work, which, if not monitored, can lead to cognitive overload (Debreli, 2026). AI use was therefore most beneficial where it reduced the initial demands of planning without removing the professional thinking required to turn a generic output into an appropriate classroom resource.

A second reason for using AI was that it helped STs respond to uncertainty and generate a wider range of pedagogical possibilities. As beginning teachers, STs did not always know how to develop a lesson sequence from a learning intention in terms of related activities or how they could be differentiated. AI provided possible starting points that still required critical appraisal. In this respect, as is also the case reported in Korucu-Kış & Bakla (2026) and Aldım *et al*., (2025), it functioned as a form of professional scaffold by making possible approaches visible and giving STs something concrete against which to exercise their judgement.

However, the extent to which AI operated as a productive scaffold depended on how it was used. Where AI-generated suggestions prompted STs to compare alternatives, question assumptions and adapt ideas to their context, it could support the development of pedagogical reasoning. Where its outputs were accepted with limited scrutiny, it risked replacing rather than supporting that reasoning and thus led to an overestimation on the part of the STs of the output's educational value (Kalenda *et al*., 2025). The value of AI as a scaffold, therefore, lay not simply in its ability to generate material but in the professional activity that followed generation.

STs were also motivated by the perceived potential of AI to support more inclusive and responsive teaching, as is also reported elsewhere (Kohnke *et al*. 2025; Moorhouse *et al*., 2024; Lee *et al*. 2021). AI offered rapid ways of generating adapted texts, alternative explanations, differentiated activities and resources for learners with AEN and those learning EAL. This was particularly attractive during placement, when STs were expected to demonstrate that they could respond to a range of learner needs while still developing their own classroom experience. Nevertheless, the findings indicate that STs did not generally regard AI-generated differentiation as automatically appropriate or effective, a finding which is not self-evident from the descriptions and analysis of other studies. They recognised that AI lacked knowledge of the individual pupils, the relationships that they had with them, learners' prior knowledge and the wider school context that informed their own decisions.

This reveals an important tension: while AI-based technologies could expand the range of possible adaptations available to them, they do not have the capacity to determine which adaptation was most appropriate for a particular learner. This is a requirement, therefore, that appears to remain with the educator from the STs' perspective. AI was therefore being used to generate possibilities for inclusive teaching rather than to make final decisions about learner needs. Its usefulness remained dependent on the situated knowledge and professional judgement of the ST.

There were also wider professional and institutional reasons for AI use. STs were undertaking placement at a time when AI was becoming increasingly visible in schools and within teachers' professional practices. Their engagement with AI was, therefore, not driven solely by convenience or personal interest but by increasingly visible expectations around AI use within the profession.

The variation between placement settings was significant in this regard. In some schools, AI use was encouraged or openly discussed, while in others it was approached more cautiously. STs were consequently required to negotiate different expectations concerning acceptable use, transparency and professional responsibility. Their practices were shaped not only by what AI could do but also by the institutional cultures in which they were learning to teach, thus adding to findings in existing research that point to formal training, access to resources, facilitating conditions and institutional support as factors that condition AI-readiness and usage in ITE (Li & Liang, 2025; Lucas *et al*., 2025). This variation may have contributed to uncertainty about when AI use was appropriate, when it should be disclosed and how it could be reconciled with existing expectations around planning, assessment and professional authenticity.

4.3 What appear to be ST strengths around AI competences and literacies?

The findings suggest that STs' strengths around AI competences and literacies were most evident in their growing confidence in practical use, their awareness of ethical and professional issues, and their recognition of the limitations of AI-generated outputs. While the evidence does not indicate that STs had developed fully established AI expertise, it does point to an emerging capacity to engage with AI in purposeful and increasingly pedagogically informed ways. Importantly, however, the data distinguish between confidence in using AI and awareness of how it should be used as well as the consistent demonstration of these competences in practice.

> ***Research point to an emerging capacity to engage with AI in purposeful and increasingly pedagogically informed ways.***

One apparent strength was STs' growing confidence in integrating AI into teaching and learning throughout the year. Although the growth was small, the increased level of confidence was also reflected in the qualitative data, in which STs described using AI-generated materials as initial suggestions rather than as finished products that could be transferred directly into practice. The strength evident within the data was therefore not simply that STs could generate teaching materials through AI but that many recognised the need to adapt what was produced by AI. Across the AI-integrated assignments and stimulated recall discussions, STs referred to checking outputs against curricular requirements, modifying materials for particular classes and rejecting suggestions that were not pedagogically appropriate. Where these processes were visible within their work, they indicated a developing capacity to incorporate AI into existing processes of professional decision-making rather than allowing the technology to determine those decisions thus maintaining their agency as professionals (Debreli, 2026). Research from Kohnke *et al.*(2025), Esteada-Molina (2025) and Moorhouse *et al.* (2024) would also promote the use of structured engagement with GenAI, such as that incorporated into the assignment described above, in teacher education to help enhance professional AI competencies and literacies.

A second strength concerned STs' emerging ethical and human-centred orientation towards AI. Survey responses indicated consistently high confidence in their ability to use AI in ethical and human-centred ways. Although this provides evidence of perceived rather than necessarily enacted ethical competence, the qualitative data suggest that many STs understood that AI should support rather than replace the relational and professional dimensions of teaching. Their concerns about generic feedback, overreliance, the loss of personal judgement and the use of AI in assessment indicate that they were beginning to identify areas in which technological efficiency might conflict with professional responsibility.

> ***STs' have emerging ethical and human-centred orientation towards AI.***

This ethical awareness was particularly evident in relation to activities requiring knowledge of individual learners. STs frequently questioned whether AI could appropriately produce personalised feedback or make decisions about pupils whose backgrounds were unknown to the AI tool. Their responses suggest that they located the value of teaching not only in the production of materials or feedback, but also in the situated and relational knowledge through which teachers make professional decisions. In this respect, STs' developing AI literacy was connected to their emerging professional identities and to their understanding of the responsibilities associated with becoming a teacher.

A third strength was STs' awareness of the limitations and apparent authority of AI-generated content. Across the focus groups, assignment reflections and stimulated recall discussions, STs identified issues including hallucinations, inaccurate curricular information, generic outputs and examples that were poorly suited to the Irish educational context. They recognised that AI-generated material could be factually inaccurate or pedagogically unsuitable but packaged in a way that made it seem convincing or appropriate. This represents an important element of emerging critical AI literacy because it indicates that STs can see through the presentation of AI-produced material to examine its true factual and pedagogical value.

> ***STs had a growing awareness of the limitations and apparent authority of AI-generated content***

> ***STs recognised that AI-generated material could be factually inaccurate but packaged in a way that made it seem convincing or appropriate.***

Nevertheless, the principal strength that STs demonstrated in this study was an awareness of the need for critical evaluation rather than evidence that this evaluation was always carried out consistently or successfully. This distinction is important. STs' recurring emphasis on the role of teacher judgement indicates that many understood the need to position themselves as evaluators of AI-generated outputs rather than as passive recipients. However, as discussed in Section 4.4, recognising this responsibility did not always mean that it was reliably enacted in practice. Awareness of AI's limitations can therefore be understood as an emerging strength, while the consistent application of critical evaluation remained an area requiring further development. The ITE educator and tutor data partially supported these interpretations. The few PME tutors that participated in the study observed that STs demonstrated awareness of ethical issues and were applying this awareness to their practice.

4.4 What appear to be ST weaknesses around AI competences and literacies?

The findings suggest that STs' weaknesses around AI competences and literacies were concentrated less in their ability or willingness to access AI and more in their depth of critical analysis.

One key area of weakness concerned the critical evaluation of AI-generated content, particularly when reported from the perspective of teacher educators and tutors. ***Although STs frequently articulated the need to question AI outputs, tutor observations indicated that this was not always clearly visible in their professional work.*** This does not necessarily indicate that STs accepted AI outputs uncritically in all cases. However, it suggests that the processes through which they checked, challenged or revised AI-generated content were either inconsistent or not sufficiently evident to those assessing and supporting them. This lack of criticality is also reported in Korucu-Kış and Bakla (2026) in which STs failed to engage in sustained critical interrogation and frequently relied on one-shot prompts. Although, we cannot corroborate this finding in this research, the self-reported data certainly points to a need to investigate whether this is the case.

This distinction between expressed awareness and observable practice is significant. STs' ability to identify hallucinations, generic responses or inappropriate examples demonstrated that they were beginning to understand the limitations of AI. Nevertheless, critical AI literacy requires more than simply an acknowledgement that outputs may be unreliable. It also involves the systematic verification of information, consideration of whose knowledge and perspectives are represented, and evaluation of whether an output is pedagogically appropriate for a particular curriculum, class and learner. The findings suggest that some STs had begun to develop these practices, but that not all STs did this consistently.

A related weakness concerned the possibility of overreliance and cognitive offloading. ***Both STs and tutors expressed concern that AI could begin to replace aspects of the professional thinking that ITE is intended to develop.*** This was particularly relevant to lesson planning and reflection. These activities are not simply products that STs are required to complete; they are processes through which beginning teachers learn to interpret curricula, anticipate learner responses, justify pedagogical decisions and evaluate their own practice. Where AI provides initial ideas that STs subsequently interrogate and develop, it may support these processes. Where it generates complete plans, for example, that are accepted with limited revision, it risks reducing opportunities for STs to develop their own professional reasoning as well as weakening creativity and critical thinking (Doğan, 2026; Kohnke *et al*., 2025). The concern was therefore not only that STs might become dependent on AI as a tool, but that such dependence could affect the formation of their professional knowledge, skills and, even, their professional identities. Some STs themselves recognised this possibility, expressing concern that excessive AI use could reduce their creativity or capacity to think independently as teachers. Tutors similarly identified instances in which AI-influenced work appeared detached from the personal and reflective stance expected of STs, which may reveal a lack of personal engagement with self-appraisal and reflection. Existing literature focusing on this issue appears to points to the converse effect, suggesting that a weakening of reflection is not an inevitable consequence of AI use. Studies in which AI-supported reflection was structured through specific prompts and combined with peer, faculty or supervisor input found improvements in reflective thinking and professional awareness (Erbay-Çetinkaya, 2025; L'Enfant, 2024). The issue may therefore lie less in whether AI is used for reflection and more in how the reflective activity is designed and mediated.

A further area of weakness related to contextual and curricular sensitivity. AI-generated outputs were frequently described by teacher educators and tutors as generic or inaccurate in the context of the Irish curriculum. Examples included invented learning outcomes, unsuitable activities and resources shaped by non-Irish or "Americanised" educational assumptions. While these limitations arise partly from the technology itself, they

also reveal an important dimension of STs' competence. Effective evaluation of AI-generated content depends on the user possessing sufficient curricular, disciplinary and pedagogical knowledge to recognise when an output is inappropriate. This creates a particular challenge for STs because they are still developing the professional knowledge required to evaluate the outputs they receive. An experienced teacher may be able to identify quickly that a suggested learning outcome does not correspond with the curriculum or that an activity is unsuitable for a particular class. A beginning teacher may be less able to distinguish a plausible and confidently expressed output from one that is accurate and pedagogically appropriate. This creates a potentially challenging environment in which AI may appear most attractive to less-experienced teachers who are uncertain about how to approach a task, while that same uncertainty may make it more difficult for them to evaluate the quality of the support provided. The findings also complicate the assumption that AI necessarily reduces teacher workload. Although AI could

> ***AI may appear most attractive to less-experienced teachers, but the same uncertainty may make it more difficult for them to evaluate the quality.***

generate an initial resource or lesson structure quickly, the need to verify information, correct inaccuracies, align materials with the curriculum and adapt them to local contexts could create additional work. This does not mean that AI was necessarily inefficient. Rather, its capacity to save time depended on the quality of the original output and the ST's ability to identify what needed to be changed. Some STs may therefore have needed a more developed understanding that rapid content generation does not remove the requirement for professional scrutiny and may, in some cases, redistribute rather than reduce workload, adding to cognitive overload and frustration (Debreli, 2026).

Reflective engagement with AI represented another comparatively underdeveloped area. STs' confidence in reflecting on their own use of AI remained among the lower competence areas across the year. Their reported ability to question attitudes towards and trust in AI also remained comparatively limited. These findings suggest that, while STs were increasingly using AI and could often identify particular risks, they were less confident in systematically examining how the technology was shaping their own decisions, practices and assumptions. However, if structured properly as a part of their ITE, it could potentially support deeper metacognition, professional awareness and reflective thinking. (Erbay-Cetinkaya, 2026; L'Enfant, 2024).

Concerns about hidden or undeclared use further illustrate this issue. ITE educators identified transparency, disclosure and the absence of clearly shared professional boundaries as areas requiring attention. This suggests that weaknesses in ethical practice should not be attributed solely to individual STs. Students were engaging with AI within an emerging and sometimes inconsistent institutional context in which acceptable uses were not always clearly defined. The ability to make responsible decisions therefore depended partly on the extent to which ITE programmes, tutors and placement schools provided coherent expectations concerning disclosure, authorship and professional accountability.

Some variation was also evident across the three disciplines. MFL STs were particularly concerned with translation, linguistic accuracy, communicative authenticity and the difficulty of determining whether student work had been produced independently. BS STs emphasised the limitations of generic outputs and the need for curriculum alignment, while HE STs identified concerns relating to accuracy, safety, pacing and the practical suitability of suggested activities. These differences indicate that weaknesses in AI competence were not entirely generic. The knowledge required to evaluate an AI-generated language activity differs from that required to assess the safety of a physical activity or the relevance of a business case study. Consequently, general guidance on checking AI outputs may be insufficient unless STs are also given opportunities to develop critical AI literacy through the particular epistemological, pedagogical and ethical demands of their subjects.

4.5 What opportunities and challenges do student teachers perceive in relation to AI and school placement?

STs perceived AI as presenting significant opportunities during school placement, while also recognising key challenges relating to reliability, overreliance, professional judgement and ethical responsibility. However, their responses did not indicate either straightforward acceptance or rejection of AI. The most immediate opportunity identified by STs concerned AI's potential to reduce some of the initial demands associated with lesson planning and resource development as observed elsewhere as part of practicum or microteaching (Aldım *et al*., 2025; Doğan, 2026; Lee & youn Ahn, 2021). During placement, STs are required to manage planning, teaching, differentiation, assessment and reflection while still developing their curricular and pedagogical knowledge. AI could help STs move beyond the difficulty of beginning a task and provide material from which their own planning could develop.

However, the opportunity was not simply one of completing work more quickly. As discussed in the preceding sections, AI frequently redistributed rather than eliminated workload. Time could be saved during the initial generation of content, but further work was required to verify accuracy, align outputs with the curriculum and adapt them to a specific class. The perceived opportunity therefore lay in the capacity of AI to create additional starting points and pedagogical possibilities, acting as a reflective partner. Whether these possibilities resulted in greater efficiency depended on both the quality of the generated material and the ST's ability to evaluate it. However, this point does require further research.

A further opportunity concerned the potential of AI to support more inclusive and responsive teaching. STs perceived that AI could help them produce alternative explanations, adapted texts, differentiated activities and resources for learners with AEN and those learning EAL. This was particularly relevant during placement, where STs were expected to respond to diverse learner needs despite having comparatively limited experience of differentiation in practice. AI could broaden the range of options available to them and make it easier to generate initial versions of materials at different levels of complexity.

Nevertheless, the findings do not demonstrate that AI-generated differentiation necessarily resulted in more inclusive or effective teaching. As mentioned, STs recognised that AI lacked key knowledge of individual learners. Therefore, AI-generated differentiation was only useful for generating possible adaptations rather than determining what a particular learner required. This distinction is important because it continues to place responsibility for decision-making around inclusive practice with the teacher rather than with the technology. AI could expand the available possibilities, but STs still needed to decide which, if any, were appropriate.
The data also pointed towards an opportunity for AI to support professional learning and dialogue during placement. The hackathon activities suggested that AI could be used to generate prompts for discussion, compare

> ***the findings do not demonstrate that AI-generated differentiation necessarily resulted in more inclusive or effective teaching.***

possible lesson plans and provide structured starting points for conversations between CTs and STs. This represents a potentially broader role for AI than its use as an individual planning tool. Rather than interacting with AI privately to produce resources, STs and CTs could use its outputs as shared artefacts for discussion and reflection. An unsuitable lesson plan or inaccurate suggestion may still have value if it prompts an ST and CT to discuss why it is inappropriate and what changes would be required. Used in this way, AI could create opportunities for STs to make their pedagogical reasoning more visible and for CTs to scaffold their development more tangibly.

Alongside these opportunities, STs identified the reliability and contextual appropriateness of AI-generated outputs as significant challenges. They recognised that AI could produce inaccurate information, invented learning outcomes and materials shaped by generic or non-Irish educational assumptions. Of particular concern was the confident and authoritative manner in which inaccurate information could be presented. This created a risk that unsuitable outputs might appear credible, especially to beginning teachers who were still developing the curricular and disciplinary knowledge required to identify errors.

A further perceived challenge concerned overreliance and its possible effects on professional learning. STs were aware that excessive dependence on AI could weaken creativity, critical reflection and confidence in their own decision-making, a concern that is not limited to the Irish context (Doğan, 2026; Zhang *et al*., 2025). This concern was particularly important within ITE because activities such as lesson planning and reflection are not merely products that need to be completed. They are processes through which STs develop curricular understanding, pedagogical reasoning and a sense of themselves as teachers.

AI could support these developmental processes when its outputs prompted STs to consider alternatives, justify decisions and refine their own ideas. However, where complete outputs were adopted with limited interrogation, it could reduce the opportunities through which professional knowledge was developed, resulting in cognitive offloading. The perceived challenge was therefore not simply that STs might use AI frequently, but that they might begin to delegate forms of thinking that were central to their professional formation.

The opportunities and challenges perceived by STs also varied according to disciplinary context. AI's potential value and its associated risks were interpreted through the particular forms of knowledge and practice valued within each

subject. In MFL, questions of linguistic accuracy, communicative authenticity and the authorship of student work were especially prominent. In HE, the suitability and safety of practical activities required careful attention, while in BS, curricular alignment and the relevance of generic examples were particularly important. These differences suggest that the responsible use of AI during placement cannot be addressed solely through general guidance. STs also require opportunities to examine its use through the epistemological, pedagogical and ethical demands of their disciplines.

4.6 Summary

The following Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis graphic [Figure 19] summarises the strengths and weaknesses of STs in relation to their use of AI as well as the opportunities that it offers them and 'threats' that they face.

Figure 19 - SWOT analysis of ST's AI use

The overarching analysis shows that STs are embracing AI use professionally, but its adoption is characterised by caution. Nonetheless, it is clear that AI usage during school placement is a common occurrence that has become increasingly embedded and normalised.

STs central strength is practical pedagogical use. They use AI purposefully for planning, resource design, differentiation and idea generation, especially when they treat AI outputs as starting points rather than finished products. Related to this, however, is their main weakness which is a lack of proactive critical engagement. STs understand that AI outputs need to be checked, but the evidence suggests that critical evaluation, reflection, contextual adaptation and questioning trust are not yet consistently embedded in practice.

AI also creates opportunities by reducing pressure at a difficult point in professional formation. During placement, STs are managing planning, teaching, assessment, reflection and adaptation. AI can reduce the initial workload and create space for more focused pedagogical thinking. Also, it is possible to conclude that AI not only reduces workload but also leads to better professional learning. AI can support differentiated resources, inclusive practice and even mentoring conversations between STs and CTs, provided it is used as a scaffold for discussion rather than a shortcut.

The main threat is that AI may appear more reliable than it is. Hallucinated learning outcomes, generic resources and "Americanised" examples demonstrate that fluent AI output can obscure inaccuracies, curriculum misalignment and weak contextual fit.

However, there is a tension between support and substitution. AI is valuable when it supports teacher thinking, but risky when it replaces planning, reflection, feedback, creativity or ethical decision-making. Overall, therefore, the findings indicate that there is a need for structured AI literacy and competency development within ITE. STs need support not only in how to use AI tools, but in how to evaluate outputs, declare use, protect professional judgement and maintain the relational nature of teaching. AI literacies and competencies are therefore still emerging and are far from complete.

Chapter 5 Conclusions and recommendations

5.1 Introduction

This final chapter draws together the key conclusions from the research and identifies recommendations for the future development of AI within Initial Teacher Education and school placement. Across the dataset, AI emerges as an increasingly normalised feature of STs' professional practice, but one that requires careful mediation through AI literacy, ethical awareness, professional judgement, subject expertise and structured institutional support.

5.2 Summary of key conclusions

AI use is already embedded within STs' school placement practice, particularly in relation to planning, lesson preparation, resource development, idea generation and differentiation.

- STs generally view **AI as a support tool rather than as a replacement for teaching,** professional judgement or relational classroom practice.
- The strongest area of developing **ST competence relates to the practical pedagogical integration of AI,** especially where STs use AI-generated outputs as starting points that are subsequently adapted, refined and contextualised.
- STs demonstrate an **emerging ethical and human-centred orientation** towards AI use. They are aware of issues such as overreliance, generic feedback, loss of professional judgement and the need to protect the relational nature of teaching.
- **STs AI literacy and competence remain uneven.** They are increasingly willing and able to use AI, but their critical evaluation of AI-generated outputs, reflective judgement, questioning of trust and contextual adaptation are not yet consistently developed.
- The most significant risk is not that STs are using AI, but that **AI outputs may be accepted too readily** because they appear fluent, confident or authoritative.
- **AI can reduce workload and support wellbeing** during placement, particularly by helping STs manage the demands of planning, preparation and resource creation.
- AI also **has potential to support inclusive practice,** especially through differentiation, adaptation of materials and support for AEN and EAL learners.
- **Disciplinary differences matter.** MFL STs were particularly attentive to linguistic accuracy, translation and communicative authenticity; HE STs' emphasised practical planning, pacing, safety and inclusion, while BS STs' focused on curriculum alignment, assessment, contextualisation and the adaptation of generic outputs.
- **Tutors and PME educators broadly share STs' cautious optimism.** They recognise AI as 'here to stay', but emphasise the need for explicit guidance, ethical frameworks, transparency, professional boundaries and structured training for both students and staff.
- The hackathon findings suggest that **AI may have value beyond individual ST use.** AI-informed protocols can support professional dialogue between CTs and STs, provided they enhance rather than replace mentoring, reflection and human judgement.

5.3 Recommendations

1. Integrate AI literacy explicitly into ITE programmes

AI literacy should be embedded as a core element of ITE rather than treated as an optional or peripheral topic. This should include foundational understanding of how AI works, its limitations, risks, ethical implications and relevance to classroom practice.

2. Develop a clear AI use policy for school placement and portfolio work

STs need explicit guidance on what constitutes appropriate, transparent and ethical AI use during school placement. This should include guidance on AI declarations, acceptable use in lesson planning, portfolio development, reflective writing, assessment design and feedback-related tasks.

3. Introduce structured AI learning early in the PME year

STs should receive structured input on AI use at the beginning of the academic year, before AI habits become established informally. Early sessions should address prompt construction, critical evaluation, ethical expectations, curriculum alignment and responsible use.

4. Focus training on critical evaluation rather than tool use alone

Training should move beyond showing students how to use AI tools. Particular attention should be given to developing activities in which STs can evaluate output accuracy, detecting hallucinations, checking curriculum alignment, identifying bias, recognising generic or non-Irish educational assumptions and judging whether AI outputs are pedagogically appropriate.

5. Develop discipline-specific AI guidance and exemplars

Given the disciplinary differences identified in the study, AI guidance should not be generic only. Subject-specific examples should be developed for subject disciplines, showing how AI can be used appropriately within the pedagogical demands of each subject.

6. Support STs to use AI for inclusion and differentiation

AI has clear potential to support differentiated explanations, adapted resources and inclusive planning for AEN and EAL learners. ITE programmes should help STs use AI in ways that enhance responsiveness to learner needs while ensuring that outputs are checked against teacher knowledge of individual pupils and classroom context.

7. Strengthen reflective practice around AI use

STs should be supported to reflect not only on what AI helped them produce, but on how it influenced their thinking, decision-making, confidence, professional judgement and sense of agency. Reflection should include attention to overreliance, cognitive offloading and the boundary between support and substitution.

8. Provide CPD for tutors, ITE educators and CTs

AI-related training should not be limited to STs. Tutors, ITE educators and CTs also need opportunities to develop shared understandings of appropriate AI use, ethical expectations, critical evaluation and how AI can be discussed productively in placement-related supervision.

9. Use AI to enhance professional dialogue during placement

The AI-informed protocols developed through the hackathon should be further refined and piloted with CTs in schools. AI could be used to generate prompts for mentoring conversations, compare lesson plans, support observation discussions and scaffold reflection, provided that CTs remain central as professional interpreters and guides.

5.4 Concluding remarks, limitations and further research

This project highlights the value of longitudinal, multi-stakeholder research for understanding how AI is being integrated into teaching, learning and professional formation during school placement. By drawing on ST questionnaires, focus groups, AI-integrated assignments, stimulated recall, tutor and ITE educator perspectives, and a collaborative hackathon, the study provides a more nuanced account than would have been possible through a single data source. The findings support emerging literature which positions AI literacy as a professional competence extending beyond technical proficiency to include critical evaluation, ethical awareness, responsible use and informed pedagogical decision-making (Alonso-García *et al*., 2025; Estrada-Molina *et al*., 2025; Moorhouse *et al*., 2024). They also align with research framing AI as a scaffold for lesson planning, materials development and professional judgement rather than as a replacement for pedagogical expertise (Debreli, 2026; Li *et al*., 2025; Pargmann *et al*., 2025; Al-Nofaie & Alwerthan, 2024).

At the same time, several limitations should be acknowledged. The study relied substantially on self-reported data and did not directly examine classroom practice or pupil learning. The pre- and post-survey samples also differed in size, meaning that changes over time should be interpreted cautiously. In addition, we cannot fully account for the possibility of AI guilt or social desirability bias, whereby STs may have under-reported, over-explained or morally framed their AI use. Some qualitative phases also involved relatively small numbers of participants, and the study was conducted within one ITE programme.

Further research should examine how AI use influences actual teaching practice, placement feedback, lesson quality and professional identity development over time. This would be particularly fruitful if conducted through the lesson observation process. Future studies could also explore subject-specific AI use in greater depth and investigate how CTs, tutors and ITE educators can collaboratively support responsible, ethical and critically informed AI use during school placement. Such work would respond directly to current gaps in the literature, where longitudinal research in authentic practicum contexts remains limited and much existing research continues to rely on perceptions rather than direct evidence of practice.

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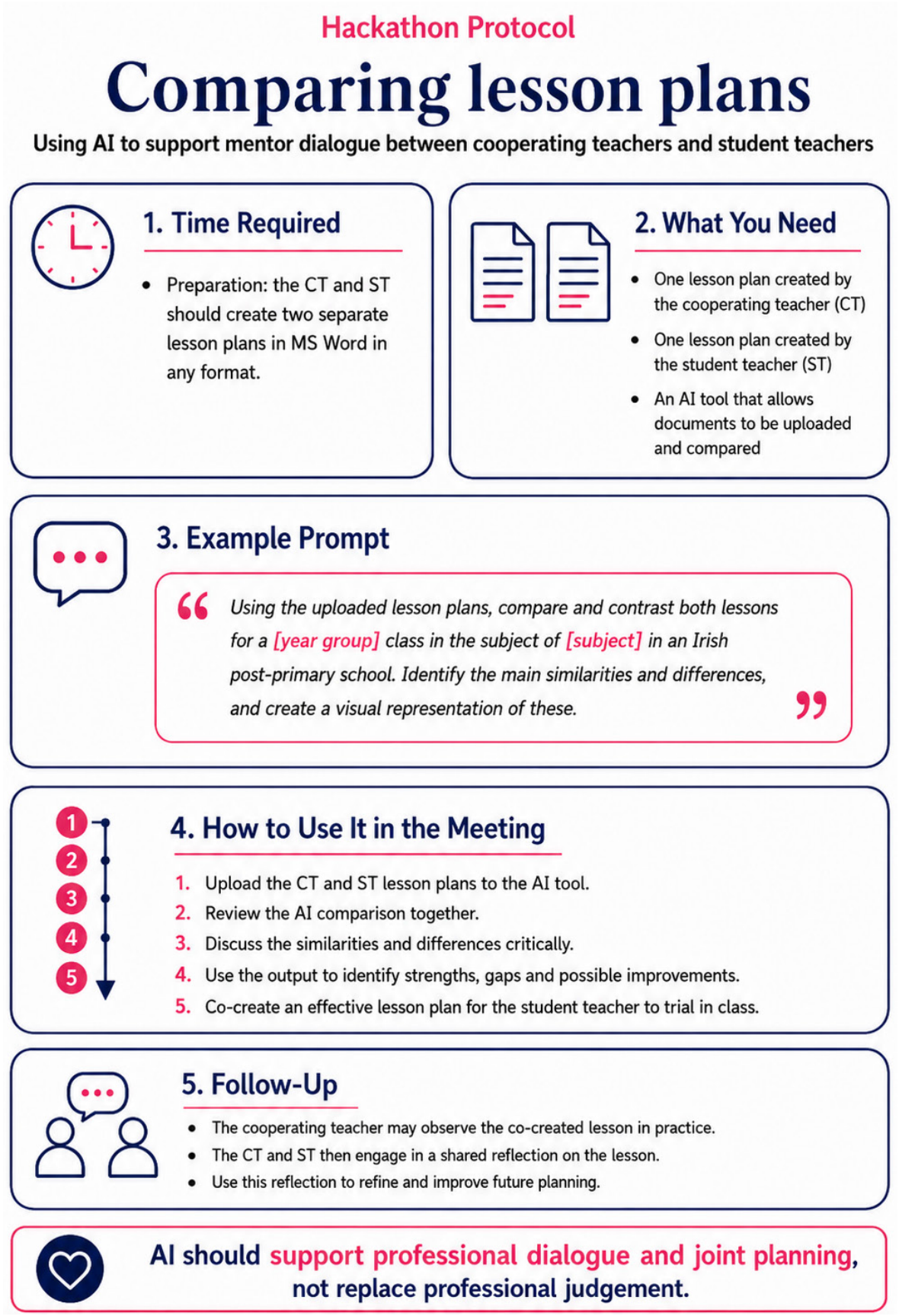
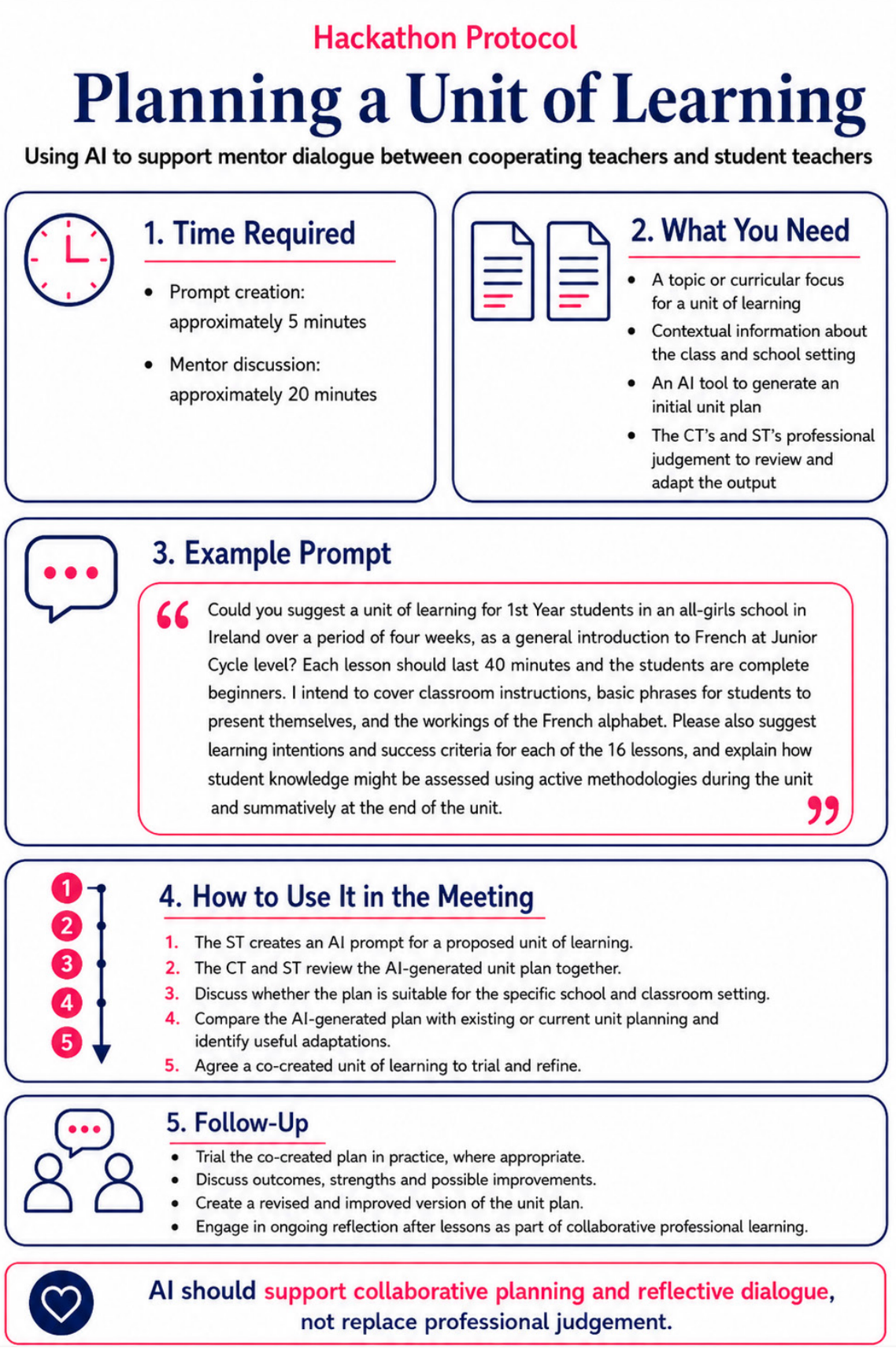
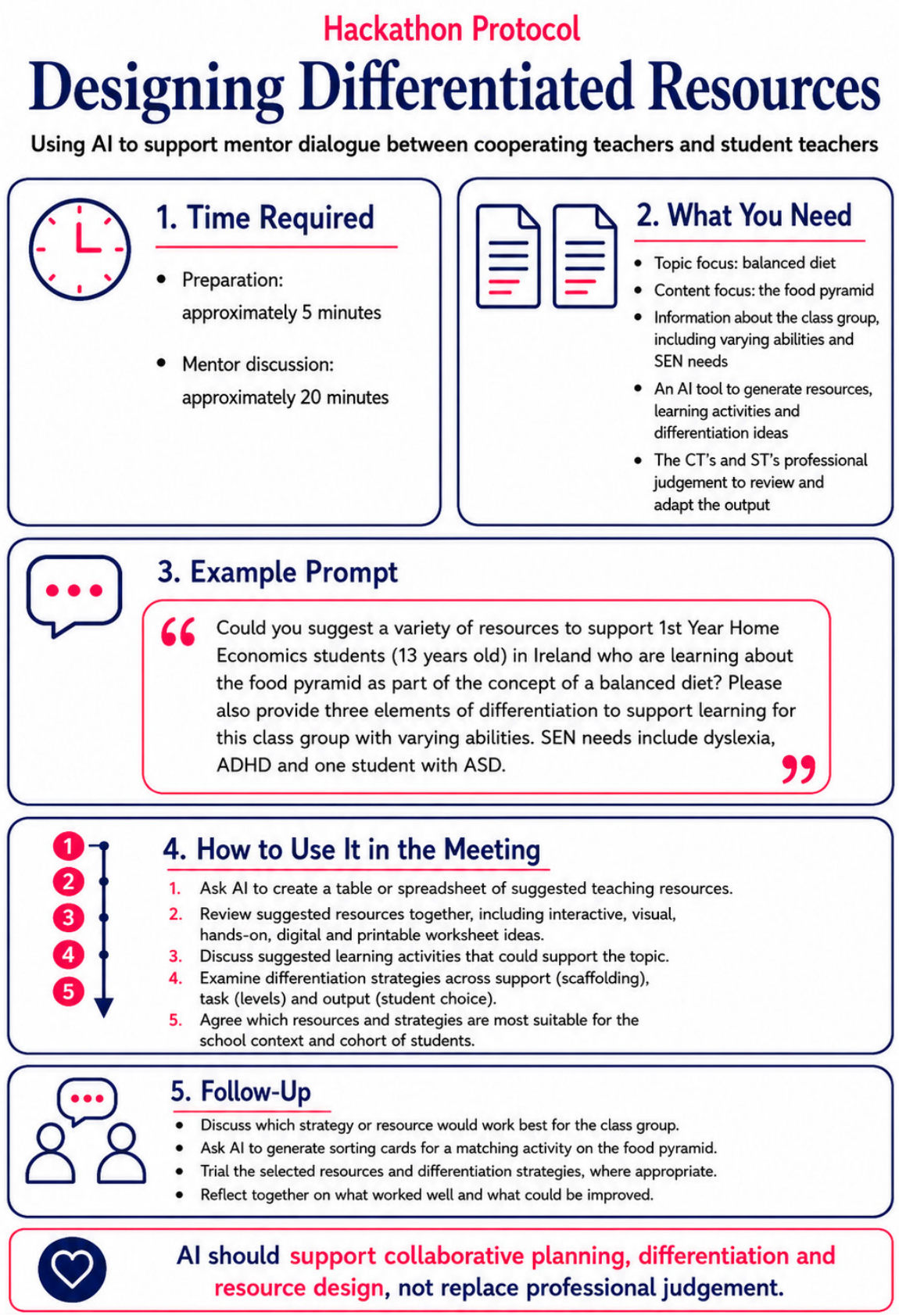
Appendices



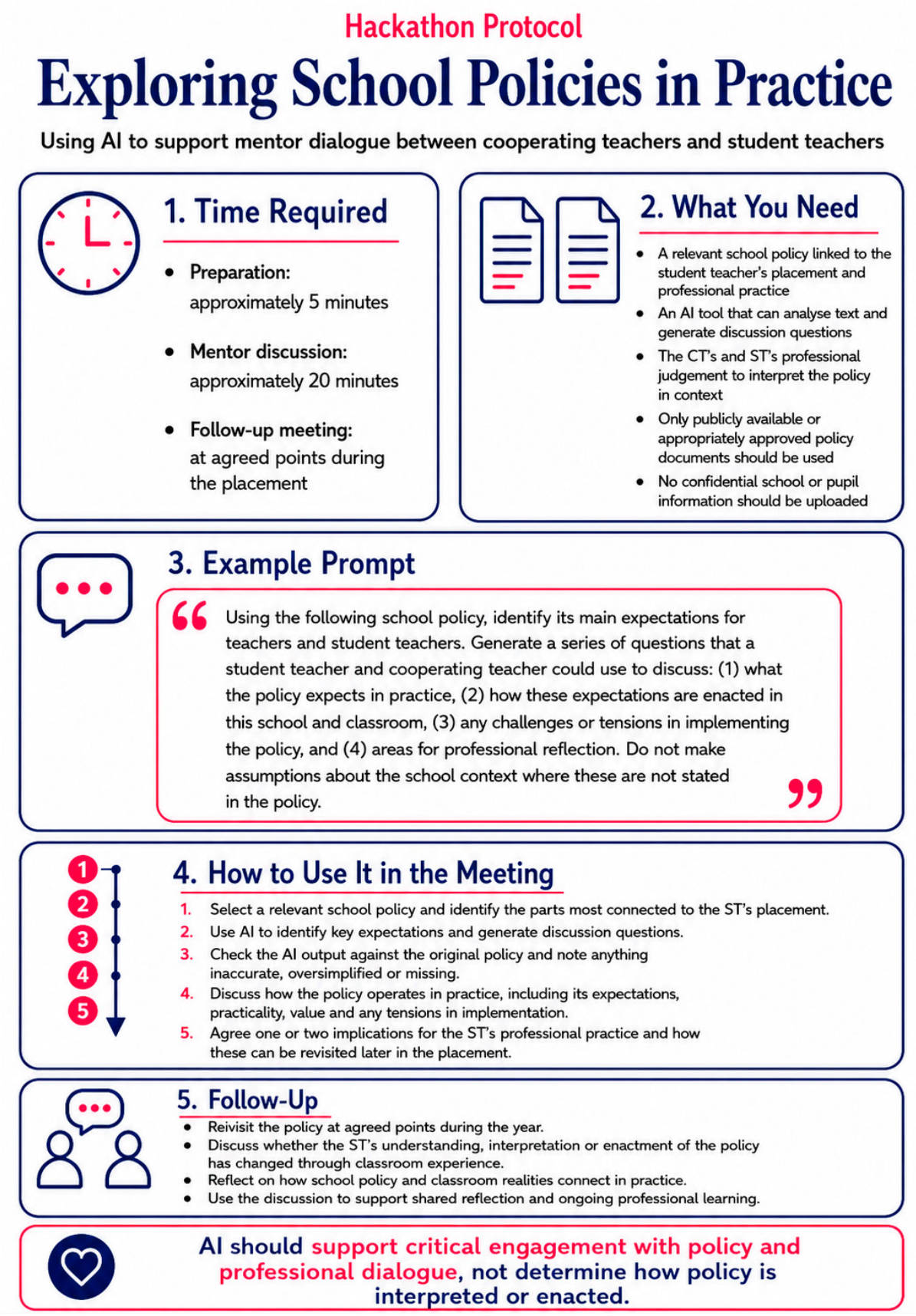
Appendix 1 – Collaborative competence, lesson plan creation (OpenAI Chat GPT, 2026)



Appendix 2 – Organisational competence, unit of learning templates (OpenAI Chat GPT, 2026)



Appendix 3 – Organisational competence, lesson planning (OpenAI Chat GPT, 2026)



Appendix 4 – Reflective competence, prompts for discussion on school policies (OpenAI Chat GPT, 2026)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