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A design-based approach to bridging the gap between university learning and classroom pedagogy in Initial Teacher Education

Abstract

This article explores the design, implementation, and evaluation of the Passports tool, developed to address the persistent challenge of bridging theoretical knowledge with practical application in Initial Teacher Education (ITE). Grounded in Design-Based Research (DBR), the Passports were iteratively created to integrate academic and professional literacies through two key components: 'Learn That' knowledge organisers and 'Learn How To' infographics. These elements provide trainees with structured support for consolidating theoretical concepts and applying them in diverse, real-world teaching contexts. Drawing on frameworks such as cognitive load theory, situated learning, and reflective practice, the Passports aim to foster adaptive expertise and reflective skills, supporting trainees as they navigate the complexities of professional placements.

Findings highlight the effectiveness of the Passports in enhancing learning and mentorship within ITE, with broader implications for other professional fields, including nursing and social work, where similar transitions from theory to practice are critical. This research contributes to the discourse on evidence-based educational tools and professional development, offering actionable insights for integrating academic and practical learning across higher education and professional training programmes.

Keywords: Initial Teacher Education; professional literacies; purposeful integration; Design-Based Research; deliberate practice.

Introduction

Universities play a crucial role in both disciplinary education and Learning Development (LD), equipping students with the skills necessary for professional success. This role is particularly significant in high-demand fields such as teaching, nursing, and social work, where graduates must transition seamlessly into complex professional environments. However, despite advances in pedagogy and curriculum design, Higher Education Institutions (HEIs) continue to grapple with the challenge of bridging the gap between

academic knowledge and workplace application (Björktomta and Tham, 2024). This is not merely a matter of theoretical versus practical learning; it is also an issue of Learning Development support, ensuring that students acquire not only the technical skills needed for their profession but also the metacognitive strategies, reflective capacities, and adaptive expertise required for sustained professional growth. Many students find the transition from academic learning to real-world application challenging, with discrepancies arising between the structured environment of university study and the unpredictable, multi-faceted nature of professional placements (Eraut, 2004b).

In the UK, where critical labour shortages in education and healthcare are well-documented, HEIs must ensure that graduates are workplace-ready while also fostering lifelong learning skills (Yorke, 2006). However, research suggests that students often struggle with translating theoretical learning into practice, particularly when they encounter unstructured, dynamic workplace environments (Molesworth, Scullion and Nixon, 2011). LD practitioners play a crucial role in supporting students through this transition, providing structured frameworks that scaffold their learning, helping them to navigate the unpredictability of professional placements while ensuring they develop the reflective and critical-thinking skills necessary for professional competence (Knight and Yorke, 2004; Wingate, 2019).

One response to this challenge has been the integration of professional placements within university curricula. While work-integrated learning can provide students with real-world contexts in which to apply their knowledge, its effectiveness varies widely. Factors such as placement quality, mentor support, and institutional resources significantly impact students' ability to make meaningful connections between theory and practice (Billett, 2011). Moreover, the accessibility and inclusivity of professional learning experiences remain key concerns for LD practitioners, as students from diverse backgrounds may face barriers to accessing high-quality mentorship and structured learning opportunities (Orland-Barak and Wang, 2020). These challenges reinforce the need for structured Learning Development interventions that help students critically engage with their professional practice, regardless of the variability in their placement experiences.

To address these concerns, structured learning tools — such as reflective frameworks, formative assessment strategies, and mentorship models — have become increasingly important in LD discourse. These tools not only facilitate the transition from academic to

professional learning but also empower students to become active participants in their development (Schön, 1983; Boud, Keogh and Walker, 1985). In ITE, where trainees must rapidly develop subject knowledge and pedagogical competence, LD-focused interventions must go beyond skill acquisition to include structured opportunities for self-reflection, mentor engagement, and deliberate practice (Ericsson, Krampe and Tesch-Römer, 1993; Christodoulou, 2017).

This article situates ITE as a key site for exploring LD strategies, examining how structured interventions can facilitate the application of theoretical knowledge within real-world classroom settings. Specifically, it explores the Passports, a structured tool designed to support trainee teachers' professional literacies by providing them with scaffolded learning activities, reflective prompts, and mentor-guided discussions. Through the lens of LD, this study underscores the importance of structured, evidence-based interventions in professional education, emphasising the alignment between university-based learning and the demands of teaching placements.

The context of UK teacher training

In the UK, ITE programmes prepare trainee teachers to meet the diverse and complex needs of today's classrooms. Trainees must navigate varied educational settings and address the unique needs of students, including those with special educational needs and disabilities (SEND) and English as an Additional Language (EAL) learners. To standardise and enhance training quality, the Department for Education introduced the Core Content Framework (CCF) in 2019, outlining minimum training entitlements for all trainees (Department for Education, 2019).

The CCF aims to provide consistent, high-quality training across providers, focusing on essential areas such as behaviour management, subject knowledge, and pedagogy. Central to this framework is the development of core teaching practices, reflective skills, and professional growth. By establishing a uniform foundation, the CCF addresses previous inconsistencies in training quality, ensuring that all trainees, regardless of provider, gain the skills needed to succeed in diverse classroom environments (Darling-Hammond, 2006; Korthagen, 2016).

Complementing the CCF, the Ofsted ITE Inspection Framework (2024) highlights the role of mentors in translating theory into practice. Mentors are essential in helping trainees

apply university-taught concepts in the classroom, offering feedback and guiding reflective practice. Ofsted's criteria assess the alignment between mentor support and CCF objectives, acknowledging that effective mentorship can significantly improve trainees' classroom performance (Hudson, 2016).

The CCF's focus on mentorship responds to observed challenges trainees face when applying theory in practical settings. Research indicates that some trainees struggle to contextualise their learning, resulting in fragmented understanding (Zeichner, 2010; Korthagen, 2016). By outlining core instructional strategies like scaffolding, questioning, and formative assessment, the CCF provides a foundation that supports immediate application of pedagogical skills in real-life teaching contexts (Darling-Hammond, 2006). Recognising mentors' pivotal role in bridging theory and practice, the CCF calls for structured mentor training and ongoing professional development. This ensures that mentors can provide targeted, theory-based support aligned with the CCF, empowering trainees to develop strong classroom competencies (Orland-Barak, 2010).

The principles behind the CCF align with global trends in teacher education, as countries worldwide increasingly seek to standardise teacher training and raise instructional quality to address diverse student needs. The principles behind the CCF also align with global trends in professional education, where evidence-based practice and standardisation are increasingly emphasised to enhance the quality of training across fields such as teaching, nursing, medicine, and law. In these professions, there is a critical need for prepared professionals who can apply theory to complex, real-world situations. This alignment reflects broader educational reform trends aimed at developing essential forms of professional literacy — skills that go beyond academic knowledge and require a deep understanding of evidence-based, context-specific practices. By fostering this form of literacy, the CCF and similar frameworks support not only technical competency but also the adaptive expertise needed in diverse, dynamic environments, meeting the educational and societal demands of a globalised world (Darling-Hammond, 2017).

The role of a mentor

Mentorship in professional education is defined by its purpose: to help students bridge the gap between theoretical knowledge and practical application. Effective mentors do more than provide support; they build collaborative relationships that foster growth, guiding students in the complex task of transferring academic concepts into strategies for real-

world contexts. This role is particularly critical in professional programmes like ITE, nursing, and other fields where students must quickly learn to apply foundational knowledge to diverse, high-stakes environments (Jones and Straker, 2006).

For ITE trainees, mentorship goes beyond instructional support — it models best practices, provides constructive feedback, and encourages reflective processes that are essential for professional development. Reflection allows trainees to critically assess their performance, identify growth areas, and continuously refine their approach, contributing to their adaptive expertise (Schön, 1983; Hudson, 2016). However, mentorship also requires trainees to develop a specific literacy in working with mentors effectively. Trainees must learn how to engage in reflective dialogue, actively seek feedback, and incorporate constructive critique into their practice, forming skills that will serve them throughout their careers.

To ensure effective mentorship, mentors need access to the right tools, resources, and a solid grasp of both subject and pedagogical theory. This includes understanding the university curriculum and using structured resources that support reflection and application, providing a clear framework for student growth (Grossman, Hammerness and McDonald, 2009). Both the Department for Education and Ofsted recognise the importance of well-prepared mentors in ITE programmes, emphasising that mentorship is a cornerstone of professional readiness across sectors, where students depend on skilled mentors to successfully transition from theory to practice.

Theoretical framework

Supporting student learning in bridging the gap between university-based education and placement practice requires a nuanced understanding of the theoretical foundations that underpin effective LD strategies. LD practitioners play a crucial role in supporting students' transitions into professional environments, ensuring they develop both disciplinary expertise and professional literacies. The following theoretical perspectives provide essential insights into how educators and LD professionals can maximise student learning by fostering reflective practice, adaptive expertise, and the ability to apply academic knowledge in real-world settings. These frameworks not only inform the pedagogical design of ITE but also align with broader LD principles aimed at empowering students to become self-directed, reflective professionals.

First, the integration of academic and professional literacies is a critical component of both LD and professional education. Lea and Street's (1998) academic literacies framework distinguishes between different approaches to literacy, highlighting that learning is not just about acquiring technical skills (such as reading and writing), but also about navigating the power structures, discourses, and practices embedded within academic and professional contexts. This distinction is especially relevant in professional training programmes, where students must develop both academic literacy — the ability to critically engage with and understand theory — and professional literacy — the ability to apply that theory effectively in real-world settings. In ITE, for example, trainees need to synthesise pedagogical theories with the realities of classroom teaching, adapting their approaches based on student needs, school cultures, and policy frameworks. This dual literacy approach is a fundamental LD concern, as it supports students in making meaning from their learning experiences, ensuring that they are able to transfer knowledge effectively between different contexts (Wingate, 2019).

Second, situated learning theory (Lave and Wenger, 1991) provides a valuable lens for understanding how learning is shaped by authentic, real-world contexts. LD professionals frequently advocate for structured, embedded learning experiences that allow students to apply theoretical concepts in meaningful ways. In ITE, situated learning occurs when trainees engage directly in teaching practices, observing experienced mentors, experimenting with lesson planning, and receiving feedback in real-time classroom settings. However, as LD research highlights, unstructured placements can limit the effectiveness of situated learning if students are not given the tools to make sense of and reflect on their experiences (Billett, 2011). This underscores the importance of structured learning tools — such as reflective journals, mentor feedback frameworks, and scaffolding strategies — that allow students to actively engage with their professional learning, rather than passively absorb workplace practices (Orland-Barak and Wang, 2020).

Third, deliberate practice theory (Ericsson, Krampe and Tesch-Römer, 1993) highlights the significance of focused, iterative practice in developing professional expertise. Learning Development strategies often centre on scaffolding skill acquisition through structured, incremental challenges, ensuring that students engage in meaningful cycles of practice, feedback, and refinement. In ITE, this means that complex teaching tasks — such as behaviour management, lesson differentiation, and formative assessment — must be broken down into smaller, manageable components. By enabling students to practise these skills systematically, HEIs can ensure that trainees gradually build competence,

receive targeted feedback, and develop confidence in their teaching abilities (Christodoulou, 2017).

Taken together, these theoretical perspectives underscore the importance of structured Learning Development interventions in professional education. The integration of academic and professional literacies, situated learning, and deliberate practice principles ensures that students are not only equipped with disciplinary knowledge but also with the tools to apply, reflect upon, and refine their skills in professional settings. Within ITE, these insights inform the design of structured support tools — such as the Passports — which provide scaffolding for reflection, mentor engagement, and skill development. By embedding these LD principles into professional education, HEIs can create more equitable, inclusive, and effective pathways for students to transition from academic study to professional practice.

Methodology

This section introduces the intervention designed to address the challenge of bridging the gap between university-based theoretical learning and the practical demands of professional practice. Trainee teachers, like students in other professional fields such as nursing and social work, often struggle to translate academic knowledge into effective practice during placements. While university education provides a robust theoretical foundation, the unpredictable nature of real-world professional settings requires students to adapt, reflect, and apply their knowledge dynamically, often in ways that are not straightforward or linear (Schön, 1983).

To address this challenge, the intervention — referred to as Passports — was developed as a structured tool to support trainees in making real-world connections between theoretical learning and professional practice. The Passports were collaboratively designed by course tutors, who also acted as researchers, alongside programme leaders and trainees within a Level 7 Post Graduate Certificate in Education (PGCE) teacher training programme. The design process was iterative and grounded in Design-Based Research (DBR), an approach that combines the development of practical tools with research-driven refinement cycles (Wang and Hannafin, 2005). The initial design phase took place from September to December 2022, with the final version of the Passport available for trainee use in January 2023.

The study involved 50 PGCE trainees, who actively contributed to the design and implementation of the Passports, and 20 mentors, who provided feedback by the end of the project. Course tutors interacted with trainees on a weekly basis, offering structured guidance on how to engage with the Passports in both university and placement settings. Mentor engagement was more variable, occurring during formal mentor training sessions, observations of trainee practice, and one-to-one support meetings, either in person or via Teams. These varying levels of interaction influenced the ways in which trainees utilised the Passports and how mentors integrated them into their own practice.

By embedding the Passports within existing mentoring and training structures, this intervention not only provided a reflective tool for trainees but also supported mentors in updating their own teaching knowledge and understanding of the programme structure. The DBR approach ensured that the Passports evolved in response to real-world feedback, strengthening their relevance and practical impact within ITE.

Intervention design: Passports

The Passports were designed to facilitate the integration of academic and practical learning by providing two key components:

1. **‘Learn That’ knowledge organisers.** These organisers aim to help trainees consolidate and retain key theoretical concepts. They break down complex pedagogical and professional ideas into smaller, manageable units that align with university curricula, such as lesson planning, assessment, and behaviour management. Drawing on cognitive load theory (Sweller, Ayres and Kalyuga, 2011), the organisers structure information into digestible segments, thereby reducing cognitive overload and enhancing long-term retention. By revisiting and reviewing theoretical material regularly, trainees solidify their academic knowledge, which can then be directly linked to practical tasks during placement. The organisers support deep learning by encouraging trainees to reflect on how specific models of classroom management or formative assessment strategies can be applied to their teaching practice in real-time scenarios (Hattie and Timperley, 2007).
2. **‘Learn How To’ infographics.** Building upon the foundation provided by the ‘Learn That’ organisers, the ‘Learn How To’ infographics focus on translating theoretical knowledge into actionable strategies. These infographics use visual aids and step-by-step guides to simplify complex pedagogical practices for mentors and trainees.

For example, the infographics provide clear instructions on conducting formative assessments or scaffolding learning for learners with additional needs. Educational psychology research supports the use of visual aids to enhance understanding and application of complex concepts (Mayer, 2020). The infographics aim not only to summarise theoretical knowledge but also to provide clear, accessible steps for how trainees can implement these concepts in practice.

Together, the 'Learn That' and 'Learn How To' components form a cohesive tool designed to bridge the gap between academic and professional learning. By offering structured support for both theory and practice, the Passports aim to ease the transition from university-based learning to real-world professional application.

Data collection and ethical considerations

Data collection for this project involved reflections from 50 trainee teachers studying on a PGCE in Further Education and Skills on their electronic individual learning portfolio (eILP) and feedback from 20 mentors at specific mentor training events on the effectiveness of the Passports between March and June 2023. These data sources provided valuable insights into how the Passports functioned in practice and highlighted areas where further refinement was necessary. As with any educational research, ethical considerations were paramount. Trainees and mentors were fully informed about the research process, and consent was obtained prior to data collection. Additionally, confidentiality and anonymity were maintained throughout the study to ensure that participants' privacy was respected.

Design-Based Research (DBR) approach

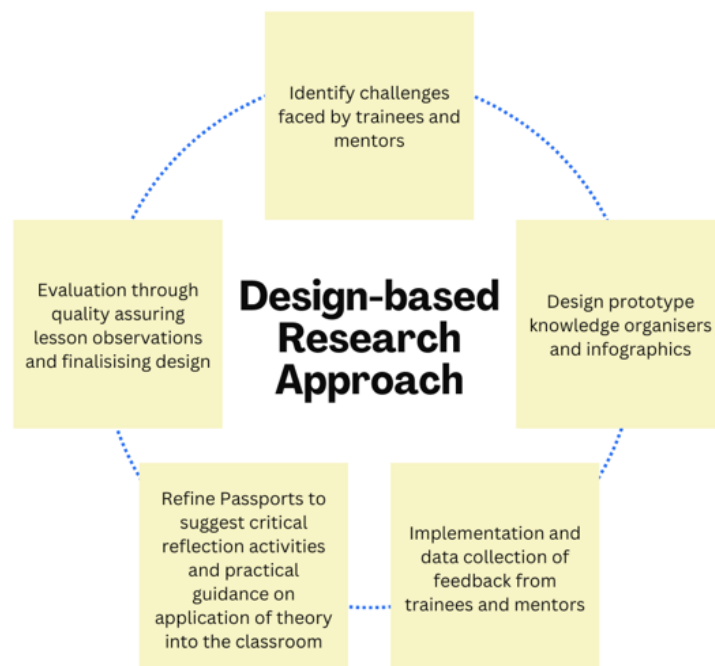
The development and evaluation of the Passports were guided by a Design-Based Research (DBR) methodology, a practice-oriented approach that bridges the gap between theory and application through iterative cycles of design, implementation, and refinement (Wang and Hannafin, 2005; Reeves, 2006). DBR is particularly relevant to Learning Development in higher education as it fosters collaboration between researchers and practitioners, ensuring that interventions are both theoretically grounded and contextually relevant (McKenney and Reeves, 2019). By embedding the Passports within authentic teaching contexts, DBR facilitated the identification of practical challenges in applying academic knowledge, thereby informing iterative refinements to enhance usability and

effectiveness. This approach aligns with constructivist theories of learning, which emphasise situated cognition and the importance of context in knowledge application (Brown, Collins and Duguid, 1989; Cobb et al., 2003). Furthermore, DBR's emphasis on iterative cycles echoes the principles of formative evaluation and agile development, ensuring that educational tools evolve based on real-world feedback (Barab and Squire, 2004).

Despite its strengths, DBR presents methodological challenges, particularly concerning generalisability and the complexity of managing iterative refinements in practice. One critique is that its highly contextualised nature can limit transferability beyond the initial research setting (Design-Based Research Collective, 2003). Additionally, DBR's reliance on close collaboration between researchers and practitioners raises concerns about scalability and resource intensiveness (Anderson and Shattuck, 2012). In practice, these challenges can be mitigated through systematic documentation of design iterations, triangulation of data sources, and multi-site implementations to enhance ecological validity (Collins, Joseph and Bielaczyc, 2004). For the Passports, integrating mixed-methods evaluations — such as post-intervention surveys, reflective accounts, and facilitation of feedback during mentor training — ensured a robust evidence base for iterative refinements while capturing diverse stakeholder perspectives (Plomp, 2013). Additionally, the application of DBR necessitates an awareness of ethical considerations, particularly in co-design processes, ensuring that practitioner input is meaningfully incorporated while maintaining research integrity (Sandoval, 2013). By addressing these limitations, DBR remains a powerful methodological approach for designing, evaluating, and refining educational interventions that are both theoretically rigorous and practically viable.

The DBR approach to the Passports is characterised by its cyclical nature, involving several stages of development (Anderson and Shattuck, 2012; McKenney and Reeves, 2019).

Image 1. Design-Based Research approach.



The initial stage of the DBR process involved identifying the key challenge faced by trainees and mentors — namely, the difficulty of connecting theoretical knowledge with practical application. Drawing on existing educational theory, including situated learning (Lave and Wenger, 1991) and deliberate practice (Ericsson, Krampe and Tesch-Römer, 1993; Christodoulou, 2017), the template of the Passports was drafted to provide structured support for integrating theory and practice. Theoretical exploration included a review of literature on cognitive load (Sweller et al., 2011) and reflective practice (Schön, 1983), which informed the structure and content of the Passports.

1. **Initial design and development of the Passports.** The first version of the Passports included both ‘Learn That’ organisers and ‘Learn How To’ infographics designed to help trainees consolidate their theoretical learning and apply it practically during placements. These organisers were available as PDFs, providing easy access to the tool throughout the training process and showcased what trainees would be learning in their university sessions. These knowledge organisers were created with feedback from educational research (Department for Education, 2019) and mentors to ensure they were practical, accessible, and aligned with the needs of trainees.
2. **Data collection and iterative feedback.** Data collection took place through feedback from trainees, mentors, and mentoring training sessions. This data was gathered through surveys and one-to-one meetings. The iterative feedback process

was essential for assessing how the Passports would function in practice, providing insights into their usability and effectiveness. Feedback from trainees highlighted the need for clearer guidance on how to reflect critically on their teaching practice, leading to the addition of more structured reflective prompts and mentor-led activities within the 'Learn That' organisers. Similarly, mentors suggested that more explicit guidance on how to use the tool in mentor–mentee discussions would be beneficial, which was incorporated into the next version.

3. **Refinement and adaptation.** Based on the feedback, the Passports were refined multiple times to better meet the needs of both trainees and mentors. Changes were made in response to real-world feedback, with new iterations of the infographics and organisers made available in print and as PDFs. The final version incorporated more reflective mentor–mentee activities, as well as detailed instructions for both trainees and mentors on how to engage with the content.
4. **Evaluation and effectiveness.** The final phase of the DBR process involved evaluating the Passports through qualitative data, including feedback from 50 trainees and 20 mentors. Observations and mentoring feedback were analysed to assess the tool's impact on bridging the gap between university-based learning and professional practice. The iterative development and feedback process highlighted key areas for improvement and refinement, allowing for a deeper understanding of the role structured tools play in integrating theory with practice in professional education. The evaluation confirmed that the Passports were effective in supporting trainees' development, and provided valuable insights into how such tools could be used in other professional education contexts (Design-Based Research Collective, 2003).

The DBR approach is inherently flexible, allowing for ongoing refinement based on real-world feedback. This cyclical process of design, implementation, and refinement ensures that tools like the Passports are both practically effective and theoretically grounded.

Image 2. Initial 'Learn That' design for the knowledge organiser.

LET'S TALK ABOUT COGNITIVE LOAD THEORY

Helping learners to relate new information, avoid cognitive overload and moving key knowledge from the short to long term memory



COGNITIVE LOAD THEORY (CLT)

CLT is concerned with the amount of information our working memory can hold and since it has a limited capacity, instructional methods should avoid overloading students with additional activities that don't directly contribute to learning (Sweller, 1988).

OUR MIND PROCESSES VISUAL AND AUDITORY INFORMATION SEPARATELY

In our working memory, auditory items don't compete with visual items in the same way that two visual items would (e.g., a picture and some text).

Working memory treats an established 'schema' as a single item and thus, learning activities that draw upon your existing knowledge expand the capacity of your working memory (by linking new knowledge to what you already know – making connections).



SCHEMA IS A MENTAL STRUCTURE TO HELP US UNDERSTAND HOW THINGS WORK

It is how we organise knowledge in our brains and how we link new learning to this existing knowledge to build or manipulate schemata (plural) to store this in our long-term memory.

If you have multiple sources of visual information, such as diagrams, labels and explanatory text, your attention is divided between them and cognitive load is then increased (Figure 1).

This effect is reduced when you integrate visual information. For example, by incorporating labels into diagrams (Figure 2), rather than placing them in a box to one side.

Split-attention effects also apply to multiple sources of auditory information (e.g., if you are speaking to learners try to remove any other sources of noise, such as other people talking).



Figure 1

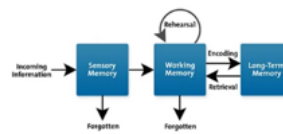


Figure 2

REMEMBER THAT

- **Working memory** is information held briefly to complete a task as small amounts of information
- **Long-term memory** is what we hold in the background – the information that, if we dig deep, we usually find
- We **structure learning** to reduce needless memory demands as working memory is capacity-limited
- **Repetition** is the best way of making sure information stays stored in the brain



Image 3. Developed knowledge organiser and infographic to reduce cognitive overload and provide key information for applications to practice and further reading.

LESSON PLANNING

SMART

Intent → Implementation → Impact

Sequencing and Cognitive Load Theory

Incoming Information → Sensory Information → Working Memory → Long-Term Memory

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LESSON PLANNING

What do we need to consider when starting to plan a lesson and how can we breakdown this process into manageable chunks to consider memory retention and cognitive load theory?

What is the purpose of an aim and objectives for both the learner and teacher and how do we begin to start writing them to inform a meaningful lesson?

A lesson plan is a teacher's guide for what students need to learn, how it will be taught, and how learning will be measured. It helps teachers be more effective in the classroom by providing a detailed outline - this ensures every bit of the session is spent teaching new concepts and having meaningful discussions.

Further Reading:

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Image 4. Final design of the Passport showcasing the 'Learn That' on the left and 'Learn How To' on the right, with the pages now titled 'Planning'.

PLANNING

Intent → Implementation → Impact

Sequencing and Cognitive Load Theory

Incoming Information → Sensory Information → Working Memory → Long-Term Memory

Cognitive Load Theory (CLT) is an instructional design theory that reflects "cognitive architecture," or the way that learners process information.

During learning, information must be held in the working memory until it has been processed sufficiently to pass into the long-term memory. A learner working memory capacity is very limited - when too much information is presented at once, it becomes overwhelming and much of that information is lost. CLT makes learning more efficient by using training methods that reflect this:

- Measuring expertise and adapting instruction accordingly
- Reducing the problem space by breaking problems down into parts - using partially completed problems and worked examples
- Merging together multiple sources of visual information
- Extending the capacity of working memory by using both visual and auditory channels

Mastering both face-to-face and remote teaching is essential for educators to effectively engage diverse learners. The ability to seamlessly transition between in-person and online instruction ensures that educators can meet the needs of all learners, regardless of their circumstances. This dual competency enhances the accessibility, flexibility, and inclusivity of education, preparing learners for success in an increasingly digital and interconnected world.

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PLANNING

Intent, Implementation and Impact & CLT

Trainees will explore lesson planning and consider how to identify key concepts and sequence these over a long period of teaching. Trainees will work towards planning a Micro-Teach session in their subject specialism.

Trainees will investigate how to plan lessons to ensure all learners participate and are effectively challenged. Trainees will be introduced to Cognitive Load Theory (CLT) to highlight the importance of not overloading learners but instead how to challenge and use prior knowledge to inform development. In this way, trainees will begin to work towards planning short-term lessons for their subject specialism.

Learning "how to"	Set high expectations for all learners in the classroom	Consider intent, implementation and impact for learner progression in trainee subject specialism	Reduce cognitive overload and improve memory retention by linking prior learning to new knowledge
Clarifying "how to"	Discuss what excellence and high challenge look like in their subject specialist area and the differences between working memory and long-term memory. Explore the concept of schemas and how these impact on curriculum sequencing and content.		
Building "how to"	Discuss how to link prior learning to new knowledge by developing schematic subject knowledge	Deconstruct a lesson plan and examine how challenge has been embedded throughout	Observe how an expert colleague reduces cognitive load
			Rehearse breaking a complex task down into composite parts

Engaging in Research:

★ Kirschner, P., Sweller, J., Kirschner, F. & Zambrano, J. (2018) From cognitive load theory to collaborative cognitive load theory. *International Journal of Computer-Supported Collaborative Learning*, 13(2), pp.213-233

★ Fernandez, J. (2022). How memory works is actually how curriculum should work. Available: https://my.chartered.college/impact_article/how-memory-works-is-actually-how-curriculum-should-work/

Further Reading:

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- Gathercole, S., Lamont, E., & Alloway, T. (2008) Working memory in the classroom. *Working memory and education*, pp.219-240

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Discussion

Implementation and feedback

The implementation of the Passports within teacher training programmes provided valuable insights into their impact on both trainees and mentors. The reflections from trainees highlighted the practicality of the Passports, particularly in bridging the gap between theory and practice, supporting lesson planning, and enhancing their sense of confidence in the classroom. Similarly, mentors noted how the Passports provided a structured framework for feedback, facilitating more targeted and granular discussions during mentoring sessions.

Trainee perspectives

A significant theme emerging from trainee reflections was the role of the Passports in helping them contextualise theoretical concepts within real-world teaching scenarios. This aligns with Kolb's (1984) experiential learning cycle, which emphasises the importance of reflective practice in professional learning. Many trainees reported that the Passports allowed them to track their progress and identify key areas for development systematically.

One trainee stated that 'I found the Passports to be really helpful in organising my thoughts and focusing on specific aspects of my teaching that I needed to improve. It helped me feel more prepared and confident in my teaching placements'. Another reflection highlighted their value as a revision and assignment tool, supporting academic development beyond the classroom: 'the Passports helped me consolidate my understanding of key theories, which was especially useful for my assignments. It gave me a clear structure to follow when applying concepts to my reflections'.

The sense of security provided by the Passports was another recurring theme. Several trainees noted that having a research-informed guide made them feel more assured in their teaching decisions. This aligns with Bandura's (1997) theory of self-efficacy, which suggests that when learners perceive their knowledge as evidence-based, they feel more competent in applying it to practice. As one trainee described, 'I liked knowing that the approaches I was using were supported by research. It made me feel more secure in my teaching and reassured me that I was on the right track'.

Additionally, the structured format of the Passports enabled trainees to use them as a roadmap throughout their training journey, supporting their ability to look both backwards and forwards in their development: 'I liked that I could look back at what I had already

covered and forward to what was coming next. It helped me set realistic goals and made mentor meetings more productive’.

Mentor perspectives

The structured nature of the Passports was also beneficial for mentors, who reported that it helped streamline their feedback processes and improve the efficiency of mentor–mentee discussions. Drawing on Hobson and Malderez’s (2013) research on mentoring in teacher education, effective mentoring relies on clear communication and a shared understanding of developmental goals. The Passports helped to establish this shared understanding. One mentor reflected that ‘the Passports made it easier for me to see exactly where my mentee was in their development and what they needed to focus on next. It gave us a structured way to approach our discussions’.

Additionally, mentors highlighted that the Passports helped them gain a deeper understanding of the teacher training programme itself, enabling them to align their feedback with the broader curriculum goals. One noted that ‘it was useful for me as a mentor to have a clearer picture of what my mentee was working on in their training. It helped me tailor my feedback to fit with what they were learning at university’.

Furthermore, some mentors noted that engaging with the Passports prompted them to reflect on their own teaching practice and stay updated on current pedagogical approaches. One mentor reflected that ‘using the Passports with my mentee actually made me rethink some aspects of my own teaching. It was a great way to engage with new ideas and refresh my own practice’. This aligns with Lave and Wenger’s (1991) concept of situated learning and legitimate peripheral participation, where both mentors and mentees co-construct knowledge through their professional interactions.

Challenges and limitations, and the ‘messiness’ of design

While the Passports were widely praised, the design and implementation process was not without its challenges. Hanghøj et al. (2022) discuss the ‘messiness’ of Design-Based Research, noting that educational interventions often evolve in unpredictable ways. One of the challenges identified in the study was the varying levels of engagement from mentors and trainees, with some finding it difficult to integrate the Passports consistently into their routines. One trainee acknowledged this tension: ‘at first, I wasn’t sure how to use the Passports effectively — it took me a while to get into the habit of referring to them regularly’.

Similarly, some mentors noted that while the Passports were useful, time constraints sometimes limited how extensively they could be used in mentoring sessions: 'I think the Passports are a great tool, but in a busy teaching week, it can be difficult to find the time to go through them in detail with my mentee'. These findings reflect broader concerns within teacher training research about the challenge of balancing structured support with the realities of workload and time pressures. Future iterations of the Passports may need to consider how to integrate their use more seamlessly into existing mentoring structures and provide additional guidance on time-efficient strategies for engaging with the tool.

Broader application to professional programmes

Originally designed for ITE, the structured, reflective approach of the Passports can be adapted to various professional programmes involving placements. In nursing education, for instance, students must balance theoretical learning with the demands of clinical practice, mirroring the challenges faced by trainee teachers. The Passports can support nursing students by incorporating 'Learn That' organisers to break down complex medical concepts like anatomy, pharmacology, and ethics into manageable segments for regular review. Additionally, 'Learn How To' infographics could serve as visual guides for essential procedures such as medication administration and patient assessment, ensuring that students apply theoretical knowledge accurately in clinical settings (Jefferies et al., 2018). Similarly, social work students must navigate complex environments where academic knowledge — such as social justice, safeguarding, and ethical practice — intersects with real-world challenges. The Passports can facilitate this learning by reinforcing key theories through structured organisers and providing infographics to guide practical applications, such as client assessments or case management. Mentors can further use these tools to support reflective practice, a crucial element in developing critical thinking and professional judgement (Wingate and Tribble, 2011).

Beyond education, nursing, and social work, the Passports can be applied to other professional fields requiring the integration of academic knowledge and practical experience. In law, they could support students in applying legal theories to real-world cases, using organisers to reinforce key legal principles and infographics to guide tasks such as drafting legal documents or preparing for court appearances. Engineering students could benefit from structured review tools to break down scientific and mathematical theories, aiding their application to practical projects. Similarly, in Business

Management, the Passports could help students contextualise management theories within work-based environments. By tailoring 'Learn That' organisers and 'Learn How To' infographics to specific disciplinary needs, the Passports offer a versatile, structured approach to professional learning across diverse sectors.

The structured, reflective approach provided by the Passports is flexible enough to be adapted to the specific needs of various professions. By offering clear frameworks for the application of theory to practice, the Passports support the development of professional competence across a wide range of fields. This adaptability makes the tool a valuable resource for any professional education programme that involves placements or internships, where students must balance academic learning with practical application.

Assessment and evaluation of practice

A significant component of the Passports is their embedded structure for formative assessment and evaluation, which supports trainee teachers in self-assessment and facilitates targeted mentor feedback. Reflective prompts and feedback-oriented activities within the Passports serve as formative assessments that guide trainees' professional development by encouraging continuous self-reflection and adaptive learning (Black and Wiliam, 1998). The tool enables both trainees and mentors to evaluate teaching competencies progressively, helping to identify specific areas for growth and improvement in real time. This aligns with the concept of 'assessment for learning', which emphasises formative assessment as essential for fostering reflective and adaptive professionals (Boud and Molloy, 2013). However, while this structured assessment model supports professional growth, it also introduces challenges, such as the risk of excessive standardisation, which may inadvertently constrain the flexibility of reflection. In practice, structured reflection tools must balance providing clear guidance with allowing for authentic, individualised professional development.

The iterative design of the Passports integrates formative evaluation into the learning process, ensuring that feedback is constructive and that trainees develop a reflective teaching practice aligned with professional standards (Sadler, 1989). However, as Hanghøj et al. (2022) argue, design processes in education are inherently 'messy', involving trade-offs, emergent challenges, and unforeseen constraints. One limitation of the Passports is that their effectiveness relies on mentor engagement and consistent implementation, which can vary significantly across placement settings (Hobson, 2016). Additionally, while the Passports aim to scaffold reflection, there is a risk of superficial

engagement, where trainees complete reflective exercises perfunctorily rather than engaging in deep, critical reflection (Moon, 1999). Addressing these issues requires ongoing refinement, including mechanisms to encourage meaningful reflection and flexible adaptation to diverse professional contexts. Ultimately, the Passports' core design principles provide a structured yet adaptable approach, but their success depends on careful implementation, iterative refinement, and critical engagement with the complexities of professional learning.

Conclusion

The Passports have proven to be an integral component of the Initial Teacher Education (ITE) curriculum, designed to bridge the persistent gap between theoretical knowledge acquired in university settings and its application in professional practice (Darling-Hammond, 2017). Unlike an optional study support tool, the Passports are embedded within the core structure of the programme, functioning as a mechanism to consolidate learning from university-based sessions, support assignment preparation, and facilitate targeted professional development through mentor interactions. This structured approach ensures that trainees engage with the Passports consistently throughout their training, reinforcing key pedagogical concepts and providing continuity between academic study and teaching placements (Loughran, 2006).

A key function of the Passports is their role in fostering reflective practice, an essential component of professional development in teacher education (Schön, 1983). By incorporating structured prompts for reflection, trainees are encouraged to critically evaluate their teaching experiences, assess the effectiveness of different pedagogical strategies, and make informed adjustments to their practice (Brookfield, 2017). This process aligns with the notion of 'deliberate practice' (Ericsson, Krampe and Tesch-Römer, 1993), which emphasises targeted skills development through iterative cycles of feedback and refinement. Crucially, the Passports enable this process by providing a structured yet flexible tool that trainees can revisit throughout their training, both as a revision aid and as a means to track their evolving competencies.

Furthermore, the Passports facilitate meaningful engagement between trainees and their mentors by serving as a focal point for professional discussions. Research highlights that effective mentoring is critical in shaping trainee teachers' professional identity and pedagogical competence (Hobson et al., 2009). The structured framework of the

Passports ensures that mentoring conversations are informed by evidence-based teaching principles, helping trainees set granular and achievable developmental targets (Hudson, 2013). This approach supports a more collaborative and goal-oriented mentoring process, reducing ambiguity and ensuring that feedback is constructive and actionable (Shulman, 1987).

However, while the Passports offer clear benefits, it is also necessary to acknowledge the challenges and potential limitations of such a structured tool. One concern is the risk of overly prescriptive frameworks constraining reflective practice, leading to superficial or compliance-driven engagement rather than deep, critical reflection (Fook and Gardner, 2007). Additionally, as Schön (1983) cautions, structured reflection tools must allow for flexibility and adaptation to individual trainees' needs rather than imposing rigid categories of reflection. To mitigate these risks, ongoing evaluation and adaptation of the Passports remain essential, ensuring that they evolve in response to trainee and mentor feedback (Laurillard, 2012).

As professions increasingly demand that students enter the workplace with both theoretical knowledge and practical skills, tools like the *Passports* will become increasingly important. Eraut (2004a) illustrates that effective professional practice is contingent upon the ability to integrate theoretical knowledge with practical experiences, reinforcing the value of the Passports in promoting such integration. Furthermore, their application in ITE highlights the role of structured reflection in developing professional identity, as articulated by Zeichner and Liston (2013), who argue that reflective practice is essential for fostering self-awareness and continuous improvement among educators.

Future research should explore how the Passports can be adapted for other professional contexts, such as healthcare and social work, where the integration of theory and practice is critical to professional success. By extending the framework of the Passports, educational institutions can support students in various fields to navigate the complexities of their respective disciplines, ensuring they are well-prepared to meet the challenges of their chosen careers. Ultimately, as the landscape of professional education continues to evolve, the Passports may serve as a vital resource for fostering a generation of professionals who are not only knowledgeable but also capable of applying their learning in meaningful ways.

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