

INTEGRATING REFLECTIVE AND DIGITAL PEDAGOGIES FOR THE ASSESSMENT OF CREATIVE COMPETENCE IN PRE-SERVICE PRIMARY TEACHER EDUCATION

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Abstract. Developing creative competence in pre-service teachers requires assessment approaches that capture reflective thinking, pedagogical decision-making, and the ability to design meaningful learning experiences. However, assessment in teacher education often remains focused on knowledge acquisition rather than on the complex competencies required for professional practice. This paper presents a pedagogical framework for assessing creative competence in pre-service primary teacher education through the integration of reflective and digital pedagogical approaches.

The framework was developed for the course “Primary Education Pedagogy, Innovation and Integration” and combines two complementary methods: Learning from Creative Errors (LCE) and Digital Creative Tool (DCT). The LCE method employs the Problem Solving and Omni-directional Methodology (PSOM) to support systematic analysis of authentic pedagogical situations, while the DCT method draws on the Technological Pedagogical Content Knowledge (TPACK) framework to guide the design of digital learning resources. Assessment is embedded within both methods through structured rubrics, including the Digital Tool Didactic Effectiveness Analysis (DTDEA) instrument and a Padlet-based reflective portfolio system.

The proposed framework is grounded in principles of alignment, embeddedness, iteration, social visibility, and transparency. By integrating analytical, reflective, creative, and digital dimensions of learning, it provides a coherent approach to assessing professional competence in teacher education. The framework offers a transferable model for higher education practitioners seeking to design assessment systems that support the development and documentation of creative competence in future teachers.

Keywords: creative competence; pre-service primary teachers; teacher education; reflective practice; digital pedagogy; competency-based assessment; TPACK; digital portfolio

1. Introduction

Teacher education is increasingly expected to prepare future teachers not only with disciplinary knowledge but also with the capacity to respond creatively to complex and unpredictable educational situations. Contemporary school environments require teachers to analyse learning challenges, adapt instructional strategies, make informed pedagogical decisions, and continuously refine their practice. As a result, creative competence has become an important component of professional teacher preparation, particularly in primary education, where teachers are expected to design engaging and developmentally appropriate learning experiences for diverse groups of learners. Despite this growing emphasis, assessment practices in teacher education

continue to focus predominantly on knowledge acquisition and academic performance, often providing limited opportunities to evaluate the reflective, analytical, and creative dimensions of professional competence.

The increasing integration of digital technologies into educational practice has added further complexity to the assessment of teacher competencies. Pre-service teachers are now expected to use digital tools not simply as technical resources but as pedagogical instruments that support meaningful learning, learner engagement, and curriculum integration. Frameworks such as Technological Pedagogical Content Knowledge (TPACK) have contributed significantly to understanding the knowledge required for effective technology integration; however, practical assessment approaches capable of capturing the interaction between creative competence, reflective practice, and digital pedagogy remain insufficiently developed. This challenge highlights the need for assessment frameworks that move beyond traditional evaluation models and provide systematic ways to document and assess complex professional learning processes in teacher education.

Although previous studies have emphasised the importance of creativity, reflective practice, and digital competence in teacher education, these dimensions are frequently addressed as separate areas of development. Existing assessment approaches often evaluate individual aspects of professional learning, such as reflective writing, digital resource production, or pedagogical knowledge, without providing an integrated framework capable of capturing their interrelationships. Furthermore, relatively limited attention has been given to assessment models that combine reflective analysis, creative problem-solving, and digitally supported pedagogical design within a coherent system of competence development. This gap creates a need for assessment frameworks that can document and evaluate the multidimensional nature of creative competence in pre-service teacher education.

This paper responds to these challenges by presenting a theoretically grounded assessment framework developed for the course 'Primary Education Pedagogy, Innovation and Integration' at an Uzbek university. The framework integrates two

purpose-designed pedagogical methods – 'Learning from Creative Errors' (LCE) and 'Digital Creative Tool' (DCT) – within an integrative pedagogical approach, and deploys the Padlet digital platform as both a collaborative workspace and a reflective portfolio environment. The assessment instruments embedded within these methods, including the Digital Tool Didactic Effectiveness Analysis (DTDEA) rubric, are designed to capture multidimensional competence development across analytical, reflective, creative-productive, and digital dimensions.

The paper makes three contributions to the literature on assessment in higher education. First, it provides a structured example of how assessment instruments can be designed to capture creative professional competence rather than merely knowledge acquisition. Second, it demonstrates how a digital platform can be integrated into assessment design in ways that support visibility, iteration, and peer-mediated learning. Third, it provides detailed, replicable instrument designs that practitioners in teacher education and related fields can adapt for their own contexts.

The paper is organised as follows. Section 2 reviews the theoretical foundations for the framework. Section 3 describes the design of the LCE method and its assessment instruments. Section 4 describes the design of the DCT method and the DTDEA instrument. Section 5 presents the Padlet-based portfolio system as an integrative assessment environment. Section 6 discusses the framework's contributions and limitations.

2. Theoretical Foundations

2.1. Creative Competence as a Target for Assessment

In contemporary teacher education, creative competence is increasingly recognised as a core professional capability that enables future teachers to respond effectively to diverse learning needs, rapidly changing educational environments, and technology-rich classrooms (Duangngern, 2025; Dolezal et al., 2025). Recent research emphasises that creative competence extends beyond the generation of novel ideas and includes the capacity to analyse educational situations, make informed pedagogical decisions, adapt instructional strategies, and design meaningful learning experiences

for learners (Duangngern, 2025). Within pre-service teacher education, the development of creative competence has therefore become closely associated with reflective practice, problem-solving ability, and the effective integration of digital pedagogies (Novoa-Echaurren et al., 2025). These findings are consistent with recent studies emphasising the importance of integrating reflective, collaborative, and digitally supported learning experiences in the development of creative professional competence (Duangngern, 2025; Novoa-Echaurren et al., 2025).

Within the context of teacher education, the development of creative competence requires learning environments that combine theoretical understanding with structured opportunities for reflective inquiry, collaborative problem-solving, and practical application. In the Uzbek educational context, Inoyatov and Muslimov (2015) and Yuldosheva (2019) have highlighted the importance of competency-based approaches that engage future teachers in active professional tasks requiring analysis, creativity, and self-evaluation. Their work reinforces broader international perspectives suggesting that creative competence develops most effectively when learners participate in iterative cycles of reflection, experimentation, feedback, and revision. These findings are consistent with recent studies emphasising the importance of integrating reflective, collaborative, and digitally supported learning experiences in the development of creative professional competence (Duangngern, 2025; Novoa-Echaurren et al., 2025).

Three theoretical traditions inform the design of assessment for creative competence in the present framework. Dewey's (1933) account of reflective thought provides the foundational orientation: effective professional learning requires not merely the accumulation of experience but its systematic reconstruction through analysis, hypothesis, and testing. Kolb's (1984) experiential learning cycle operationalises this insight as a four-stage process – concrete experience, reflective observation, abstract conceptualisation, active experimentation – that maps directly onto the activity sequences designed within both methods. Rogers and LaBoskey (2016) extend this reflective tradition into the specifically social and dialogic

dimensions of professional learning, emphasising that reflective growth is deepened through collaborative inquiry and peer challenge.

Inoyatov and Muslimov (2015) and Yuldosheva (2019) have situated these frameworks within the Uzbek pedagogical context, demonstrating that the development of creative competence in pre-service teachers requires both theoretical grounding and structured practical application through methods that demand active problem-solving and iterative self-evaluation.

The key assessment design implication of this theoretical orientation is that creative competence cannot be measured through a single endpoint evaluation. It requires assessment instruments that capture process as well as product – the quality of analytical reasoning, the depth of reflection, the capacity for responsive revision – across multiple cycles of activity. This demands a shift from summative to formative and portfolio-based assessment paradigms (Earl, 2003; Black & Wiliam, 1998).

2.2. Integrative Pedagogy and the Role of Digital Environments

In contemporary teacher education, integrative pedagogy has gained increasing attention as a means of bridging the gap between theoretical knowledge and professional practice. Rather than treating subject knowledge, pedagogical understanding, and contextual application as separate domains, integrative approaches encourage learners to establish meaningful connections among them, supporting the development of coherent and transferable professional competence. In teacher education, such approaches enable pre-service teachers to relate educational theory to authentic classroom situations and to design learning experiences that respond effectively to diverse learner needs.

Integrative pedagogy refers to approaches that deliberately connect disciplinary content, pedagogical methods, and contextual application, enabling learners to form coherent and transferable professional understanding (Drake & Reid, 2018). In teacher education, integrative approaches require students to see connections across subject areas, to understand pedagogical theory in relation to practical situations, and to design learning experiences that harness these connections productively.

The Technological Pedagogical Content Knowledge (TPACK) framework (Koehler & Mishra, 2009) extends integrative thinking into the domain of digital technology and continues to provide an influential basis for understanding technology integration in teacher education (Mahbera, 2025). For assessment design, this means that evaluating a student's use of digital tools requires attending not merely to technical proficiency but to the purposefulness and pedagogical appropriateness of their digital choices. This perspective is particularly relevant for the present framework, where the assessment of digital resources is based not on technical sophistication alone but on the pedagogical value that technology contributes to learning.

Papert's (1980) constructionist theory provides additional justification for creation-based digital assessment: the act of producing a sharable digital artefact a resource that others can use and evaluate deepens conceptual understanding in ways that passive consumption or written description cannot. Vygotsky's (1978) zone of proximal development theory underpins the collaborative dimension of the framework, suggesting that peer interaction, visible in the shared Padlet workspace, can scaffold competence development beyond what individual work alone would achieve. Together, these perspectives support the use of collaborative digital environments in which students can create, share, discuss, and revise pedagogical products as part of an ongoing learning process.

Barrett (2007) and Pachler, Bachmair, and Cook (2010) have addressed the specific challenges of assessment in digital learning environments, arguing that portfolio-based approaches which document learning trajectories, capture multiple iterations of work, and support reflective commentary are more consonant with the process-oriented, collaborative nature of digital learning than traditional summative assessment. The Padlet-based portfolio system described later in this paper operationalises these principles by providing a structured environment for documenting learning processes, revisions, reflections, and evidence of competence development over time.

2.3. Assessment Design Principles Informing the Framework

The assessment framework presented in this paper is grounded in five design principles derived from the theoretical literature. First, alignment: assessment criteria should directly correspond to the competencies being developed, with each criterion specifying observable evidence of progress (Biggs & Tang, 2011). Second, embeddedness: assessment should be integrated within learning activities rather than appended to them, so that evaluation and development occur simultaneously (Earl, 2003). Third, iteration: assessment should create structured opportunities for revision based on feedback, making improvement visible and documentable (Black & William, 1998). Fourth, social visibility: assessment should benefit from peer observation and peer feedback, leveraging the social dimensions of learning (Vygotsky, 1978; Bandura, 1977). Fifth, transparency: criteria should be made explicit to students before activity begins, enabling self-regulated engagement with standards (Sadler, 1989).

Recent research in higher education has further reinforced the importance of these principles for assessment design in digitally enriched learning environments. Studies have shown that assessment approaches characterised by constructive alignment, iterative feedback processes, transparent criteria, and opportunities for peer interaction contribute positively to learner engagement, self-regulation, and the development of higher-order competencies. These findings are particularly relevant in teacher education, where professional competence develops through repeated cycles of practice, reflection, feedback, and revision within collaborative learning communities (Carless & Winstone, 2023).

These five principles are instantiated differently in the LCE and DCT methods but are present across both, creating a coherent assessment philosophy that runs through the entire framework.

3. The 'Learning from Creative Errors' Method: Design and Assessment

3.1. Conceptual Rationale

The LCE method is premised on the pedagogically grounded view that errors and difficulties in professional practice, when approached analytically and reflectively, constitute productive learning resources rather than failures to be minimised. This

orientation draws directly on Dewey's (1933) account of problematic situations as the generative starting point for reflective thought, and on Rogers and LaBoskey's (2016) model of reflective inquiry, which emphasises the value of examining one's own practice with critical honesty.

The method addresses a specific deficit frequently observed in pre-service teacher education: students' tendency to evaluate pedagogical situations superficially, attributing difficulties to single causes and generating only obvious or familiar solutions. The PSOM analytical structure described below is designed to disrupt this tendency by requiring students to approach any pedagogical situation from four systematically distinct directions, preventing premature closure and encouraging the generation of multiple interpretive and solution-oriented perspectives.

3.2. The PSOM Analytical Tool

The PSOM (Problem Solving and Omni-directional Methodology) tool is a structured four-directional analytical framework developed specifically for use within this method. The design of the PSOM framework was motivated by the observation that pre-service teachers frequently approach pedagogical problems from a single perspective, often focusing on immediate symptoms rather than examining underlying causes, broader consequences, and alternative responses. To address this limitation, the framework was intentionally structured around four complementary analytical dimensions. Together, these dimensions encourage students to move from problem identification to causal analysis, consequence evaluation, and solution generation, thereby supporting a more comprehensive and reflective approach to pedagogical decision-making. In this respect, PSOM functions not only as an analytical procedure but also as a formative assessment scaffold that makes students' reasoning processes visible for feedback and evaluation. It requires students to examine any pedagogical situation across four dimensions: (P) clarification of what is actually known and what requires further investigation; (S) identification of the causes contributing to the observed difficulty, examined across methodological, psychological, and organisational factors; (O) assessment of the consequences of the identified problems

for learners, for the group, and for the teacher; and (M) generation and comparison of multiple alternative solutions, each evaluated for feasibility, alignment with learning objectives, and likely impact.

Although PSOM is presented here as a practical assessment tool, its structure is grounded in established traditions of critical inquiry, systems analysis, and reflective problem-solving that have long informed professional education.

The PSOM structure draws on four theoretical orientations. Critical thinking theory (Paul & Elder, 2001) informs the clarification dimension, emphasising the importance of distinguishing established facts from interpretations and assumptions before proceeding to analysis. Systems thinking (Senge, 1990) informs the causes dimension, directing students to consider how different levels and types of factors interact to produce observed outcomes. The consequences dimension is informed by reflective evaluation traditions in teacher education, which emphasise anticipating the effects of pedagogical decisions on learners, classroom interaction, and learning outcomes. Constructivist problem-solving theory informs the solutions dimension, requiring students to generate and compare alternatives rather than converging prematurely on a single answer.

The PSOM tool is designed for group use, with three to four students working collaboratively within a shared Padlet workspace. This configuration leverages the social visibility principle: each group's analysis is visible to all other groups, enabling comparative learning and productive challenge.

3.3. The LCE Method: Stage Structure

The LCE method is structured in five sequential stages within an 80-minute session. Stage 1 (10–12 minutes) – Situation Identification: Students identify and describe a problematic teaching situation, drawn either from their own practicum observations or from teacher-prepared scenario materials posted on Padlet. The stage is framed explicitly around the view that errors are learning opportunities, orienting students' affective as well as cognitive engagement with the material.

Stage 2 (20–25 minutes) – PSOM Analysis: Working in groups, students apply the PSOM framework to the identified situation, recording their analysis in the designated Padlet workspace. The instructor provides directional prompting without supplying answers, supporting the process without foreclosing student inquiry.

Stage 3 (15–20 minutes) – Solution Development and Evaluation: Groups develop and evaluate alternative solutions, applying the three-criterion rubric described below. Solutions are posted to Padlet's comparative analysis board, enabling cross-group comparison.

Stage 4 (15–20 minutes) – Lesson Redesign: Groups use their evaluated solution as the basis for redesigning a lesson fragment, moving from analytical to generative professional activity. This stage instantiates the active experimentation phase of Kolb's (1984) experiential learning cycle.

Stage 5 (8–10 minutes) – Reflective Portfolio Entry: Students individually complete a structured reflective portfolio entry, guided by five prompts: new knowledge acquired; difficulties encountered in the analysis process; how they would approach a similar situation differently; skills developed through the activity; and priorities identified for further development.

3.4. Assessment Instruments for the LCE Method

Assessment within the LCE method is structured around two instruments. The first is a solution evaluation rubric used in Stage 3, comprising three criteria: alignment with learning objectives (0–5 points), feasibility given available time, tools, and context (0–5 points), and likely impact on learner outcomes (0–5 points), for a maximum of 15 points per solution. This rubric serves as both a peer-assessment tool and a pedagogical prompt, requiring students to articulate evaluative reasoning rather than merely ranking solutions intuitively.

The second instrument is the session assessment rubric, applied by the instructor to the full LCE activity. It comprises five criteria: quality of PSOM analysis (0–25 points), evaluating the depth, multi-directionality, and analytical rigour of the group's examination; quality of alternative solutions (0–25 points), assessing the range,

justification, and comparative evaluation of proposed approaches; lesson redesign quality (0–20 points), examining the coherence between identified problems, selected solutions, and redesigned lesson elements; peer feedback quality (0–15 points), rating the specificity, constructiveness, and analytical grounding of feedback offered to other groups; and reflective portfolio quality (0–15 points), assessing the depth of personal reflection and the clarity of identified development priorities. The total is 100 points.

The weighting of rubric criteria reflects the pedagogical priorities of the LCE method. Greater weight is assigned to PSOM analysis and the generation of alternative solutions (25 points each) because these activities represent the core analytical and creative dimensions of the framework. Lesson redesign (20 points) assesses the application of analysis to pedagogical planning, while peer feedback and reflective portfolio entries (15 points each) support the development of collaborative and metacognitive competencies. The weighting scheme therefore aligns assessment emphasis with the intended learning outcomes of the method.

Table 1. LCE Session Assessment Rubric

Assessment Criterion	Max Points	High Performance Indicators
Quality of PSOM analysis	25	Situation examined across all four PSOM dimensions; multiple causal factors identified; evidence distinguished from inference
Quality of alternative solutions	25	Multiple distinct solutions proposed; each evaluated against criteria; comparative reasoning made explicit

Assessment Criterion	Max Points	High Performance Indicators
Lesson redesign quality	20	Redesign directly addresses identified problems; learning objectives, activities, and assessment aligned
Peer feedback quality	15	Feedback specific and criterion-referenced; analytical rather than evaluative in tone
Reflective portfolio quality	15	Personal insights articulate; connections to future practice made explicit; development priorities specific
Total	100	

4. The 'Digital Creative Tool' Method: Design and Assessment

4.1. Conceptual Rationale

The DCT method addresses a widely observed gap in pre-service teacher education: students may be frequent users of digital tools in their personal lives yet lack the capacity to deploy those tools purposefully and pedagogically in their teaching practice. The distinction between using a tool and teaching with it is precisely the distinction the TPACK framework (Koehler & Mishra, 2009) articulates: effective technology integration requires the integrated application of content knowledge, pedagogical understanding, and technological competence, not merely technical proficiency.

The DCT method is designed to develop and assess this integrated capacity through creation-centred activity. Drawing on Papert's (1980) constructionist theory, the method requires students to produce sharable digital learning resources for primary school contexts – resources that others can use, evaluate, and provide feedback on. This

creation-centred approach is theoretically preferable to passive analysis because the act of producing a resource that must actually work for specific learners, in specific contexts, demands the integration of content, pedagogical, and technological thinking in ways that merely describing a resource does not.

4.2. The TPACK Design Matrix

The TPACK Design Matrix is a planning instrument developed for use in Stage 2 of the DCT method. It structures students' pre-production thinking across five dimensions aligned with the TPACK framework: pedagogical purpose (what specific learning outcome the resource is designed to develop, and which pedagogical approach it employs); subject alignment (how the resource connects to specific curriculum content); learner activity (what students will actively do with the resource, emphasising participatory rather than passive engagement); creative engagement potential (whether the resource creates opportunities for students to generate, evaluate, or transform ideas rather than merely receive them); and technological appropriateness (whether the tool selected is accessible, age-appropriate, and technically feasible for primary school use).

The matrix requires students to complete each dimension before beginning production, and is revisited during Stage 5 as part of the revision process. This before-and-after use of the matrix makes the relationship between planning decisions and production outcomes visible, supporting metacognitive reflection on the design process.

4.3. The DCT Method: Stage Structure

The DCT method is structured in five stages within an 80-minute session. Stage 1 (10–12 minutes) – Tool Orientation: The instructor introduces the session's pedagogical focus and the TPACK design matrix. Students are introduced to a range of digital tools including Padlet (collaborative organisation and material sharing), Canva (visual material creation), Mentimeter (interactive polling and real-time feedback), and Book Creator (digital book and resource creation). The introduction emphasises the concept of tool selection as a pedagogical decision, not merely a technical preference.

Stage 2 (variable) – TPACK-Based Planning: Students individually or in pairs complete the TPACK Design Matrix, planning their digital resource before beginning production. The instructor circulates, prompting students to articulate the reasoning behind their design choices.

Stage 3 (25–30 minutes) – Digital Resource Creation: Students create their resource using their chosen platform. Emphasis throughout is placed on producing resources that activate learners rather than merely presenting information to them.

Stage 4 (12–15 minutes) – Presentation and Peer Feedback: Students present their resources to the group, explaining the pedagogical rationale behind their design decisions. Peers provide written feedback on Padlet, using the DTDEA criteria described below to structure their comments.

Stage 5 (8–10 minutes) – Portfolio Consolidation and Reflection: Students revise their resources based on received feedback, retaining both original and revised versions in their Padlet portfolio. A brief reflective entry addresses three questions: what design decisions were revised, why those revisions were made, and what the revision process revealed about the relationship between pedagogical intention and digital execution.

4.4. The DTDEA Assessment Instrument

The design of the DTDEA instrument was guided by the observation that many existing digital resource evaluation rubrics emphasise technical quality, visual presentation, or usability, while giving comparatively less attention to pedagogical effectiveness. The four criteria were therefore selected to capture dimensions considered essential for meaningful educational technology integration: pedagogical alignment, learner engagement, developmental appropriateness, and curriculum relevance. Together, these dimensions provide a balanced evaluation of how effectively a digital resource supports learning rather than merely how well it is constructed.

The DTDEA operationalises these design principles by providing a structured instrument for evaluating digital learning resources from a pedagogical rather than a technical perspective. It was developed in response to the observation that existing

digital assessment rubrics in teacher education tend to focus on technical quality (visual design, navigability, media use) rather than on the pedagogical effectiveness of the resource for specific learners in specific contexts.

The DTDEA comprises four criteria, each rated on a ten-point scale for a maximum of 40 points. The first criterion – alignment with learning objectives – asks whether the resource is directed towards a clearly defined learning outcome and whether its content, activities, and structure are coherently organised to achieve that outcome. The second – degree of learner activity – assesses the extent to which the resource positions learners as active participants rather than passive recipients, attending to the cognitive demands placed on learners by the resource's tasks and interactions. The third – age appropriateness – evaluates whether the resource's language, visual design, cognitive demands, and interaction patterns are appropriately matched to the developmental characteristics of primary school learners. The fourth – curriculum integration potential – considers whether the resource can be used across multiple subjects or topics, supporting the integrative pedagogical approach that is central to the course.

The DTDEA is used in three distinct assessment contexts within the DCT method. In Stage 4, it is used by peers to provide structured feedback on presented resources. In Stage 5, it is used by students themselves to guide their revision process. At course end, the instructor applies it to evaluate the final versions of resources stored in students' portfolios.

Table 2. DTDEA Instrument: Criteria, Descriptors, and Scale

Criterion	What Is Being Assessed	Score Range	Low Performance	High Performance
Alignment with learning objectives	Coherence between resource design	0–10	Resource content loosely or	All elements directly and explicitly

Criterion	What Is Being Assessed	Score Range	Low Performance	High Performance
	and stated learning outcome		indirectly related to stated objective	serve the stated learning objective
Degree of learner activity	Extent to which resource activates rather than passivates the learner	0–10	Learner receives information with no generative task	Learner is required to produce, evaluate, or transform ideas
Age appropriateness	Match between resource demands and primary-age developmental characteristics	0–10	Language, tasks, or design unsuitable for primary school learners	All elements carefully calibrated to primary-age cognition and engagement patterns
Curriculum integration potential	Degree to which resource supports cross-subject or multi-topic use	0–10	Resource applicable only in a single narrow context	Resource readily adaptable for multiple subjects and curriculum contexts

4.5. DCT Session Assessment Rubric

In addition to the DTDEA, the DCT method employs a session-level rubric comprising five criteria: completeness and pedagogical coherence of the digital resource (0–25 points); quality of digital element use, evaluating whether media and interactive elements serve pedagogical rather than merely decorative purposes (0–20 points); quality of self-assessment, examining how explicitly and accurately students identified the strengths and limitations of their own resource (0–20 points); quality of peer feedback provided to others, assessing its specificity and criterion-groundedness (0–20 points); and quality of the revision and documentation process, examining the depth of change made and the clarity of the reasoning recorded (0–15 points), for a total of 100 points.

5. The Padlet Portfolio System as an Integrative Assessment Environment

5.1. Platform Rationale

The Padlet digital platform functions in this framework not merely as a convenient workspace but as a theoretically motivated assessment environment. Several of its features are pedagogically significant. Its real-time collaborative visibility means that all students' work – analyses, solutions, resources, reflections – is accessible to the full group throughout sessions, enabling the social learning processes that Bandura's (1977) observational learning theory and Vygotsky's (1978) zone of proximal development theory predict will support competence development beyond what individual work alone achieves. Its multimedia flexibility allows students to document their learning in multiple modalities – text, images, video, hyperlinks – supporting the diverse intelligences and learning styles that Gardner (1983) identifies. Its archival capacity enables the accumulation of longitudinal evidence of development, which is essential for portfolio-based assessment (Barrett, 2007).

Padlet was launched in 2011 (originally as Wall.fm, relaunched under its current name in 2012) and has been adopted in educational contexts across multiple countries. Research from Finland, Canada, South Korea, and Australia has documented its effectiveness in supporting collaborative activity, reflective practice, portfolio

construction, and cross-subject integration in higher education settings. The present framework builds on these established uses while extending them to the specific context of creative competence development in pre-service teacher education.

5.2. Portfolio Structure

The Padlet portfolio is structured around five sections that correspond to the five assessment dimensions tracked across the course. The Introduction section, completed at the start of the course and revisited at its end, records the student's professional goals, current self-assessment of competencies, and aspirations for development – creating a before-and-after record that makes the trajectory of growth visible to both student and instructor.

The Practical Activities section accumulates the products of all LCE and DCT sessions: PSOM analyses, solution evaluations, lesson redesigns, and digital resources, each labelled with date and topic and accompanied by a brief contextual note. The Reflective Entries section holds the structured portfolio reflections completed at the end of each session, providing a regular record of metacognitive engagement with learning. The Revision Documentation section holds paired original and revised versions of digital resources created in the DCT method, making the improvement process visible and documentable. The Final Synthesis section, completed at course end, requires students to review all portfolio materials and produce a structured account of their professional development, identifying patterns in their growth, persistent challenges, and priorities for continued learning.

5.3. Portfolio Assessment Criteria

The portfolio is assessed at course end using a five-criterion rubric designed to evaluate the quality of the documentation and reflection process rather than merely the quality of individual products. The rationale for this focus is that the portfolio's primary function in this framework is metacognitive and developmental: it is intended to make growth visible and to support self-regulated professional development, not simply to archive finished work.

Table 3. Padlet Portfolio Assessment Rubric

Criterion	Max Points	High Performance Indicators
Variety of work represented	20	Portfolio includes products from multiple session types; range of activity formats documented
Quality of reflective entries	25	Reflections move beyond description to analysis; connections to theory and future practice made explicit
Developmental trajectory	25	Evidence of change over time; specific improvements between early and later work identified and discussed
Portfolio organisation	15	Materials systematically labelled, dated, and arranged; easy to navigate; contextual notes informative
Quality of final synthesis	15	Synthesis integrates specific evidence from portfolio; development account nuanced and self-critical
Total	100	

5.4. Integration of the Two Methods Within the Portfolio

A distinctive feature of the framework is that the LCE and DCT methods are not assessed as separate activities but are integrated within the single portfolio system. This integration is theoretically motivated: the two methods develop complementary dimensions of creative competence – the LCE method developing analytical and reflective capacities, the DCT method developing creative-productive and digital capacities – and the portfolio is intended to document how these dimensions develop in relation to one another across the course.

In practice, this means that portfolio entries from LCE sessions often inform the design rationale articulated in DCT sessions, and vice versa. A student who has developed refined PSOM analytical skills may bring that multi-directional analytical habit to the evaluation of their own digital resources using the DTDEA instrument. A student who has developed confidence in digital production through the DCT method may bring a more technically fluent approach to the Padlet-based documentation of their LCE reflections. The portfolio provides the longitudinal view necessary to see and assess these cross-method developmental connections.

6. Discussion: Contributions, Design Rationale, and Limitations

6.1. Contributions to Assessment Design in Higher Education

The framework described in this paper makes three contributions to theory and practice in assessment design in higher education. The first is conceptual: it demonstrates how complex professional competencies – specifically, the creative competence required for effective primary school teaching – can be disaggregated into assessable dimensions without reducing them to simplistic rubrics. The PSOM and DTDEA instruments operationalise multi-dimensional constructs (analytical depth, pedagogical purposefulness, age-appropriate design) into specific, gradable criteria while retaining the complexity of the underlying competency.

The second contribution is instrumental: the PSOM and DTDEA instruments, and the portfolio rubric, are described with sufficient specificity to be adapted by practitioners in analogous contexts. Teacher educators working in other disciplinary areas, or in systems with different digital infrastructure, can adopt the underlying design principles – embeddedness, iteration, social visibility, transparency – while adapting the specific instruments to their contexts.

The third contribution is architectural: the framework demonstrates how a digital platform can be integrated into assessment design in ways that serve pedagogical rather than merely logistical purposes. The Padlet portfolio system is not simply a convenient storage medium; it is an assessment environment specifically designed to make the

social, iterative, and longitudinal dimensions of creative competence development visible, documentable, and evaluable.

6.2. The Importance of Iterative Assessment Design

A central design principle of the framework is that assessment should create structured opportunities for revision based on feedback. In the DCT method, this is instantiated through the requirement to document both original and revised versions of digital resources; in the LCE method, it is instantiated through the structured progression from analysis to redesign. The rationale, following Black and Wiliam (1998), is that formative assessment is only fully effective when it generates responsive improvement rather than merely diagnosing deficiency.

The iteration principle has an additional assessment design implication that is less frequently discussed: it requires assessment instruments capable of evaluating a process, not merely a product. The DCT session rubric's criterion for 'quality of the revision and documentation process' (0–15 points) is specifically designed for this purpose, asking not whether the final resource is good but whether the student's engagement with feedback was thoughtful and their reasoning about revision was explicit. This shift from product to process evaluation is, we argue, essential for assessing creative competence authentically.

6.3. Assessment as a Learning Environment

Earl's (2003) distinction between assessment of learning, assessment for learning, and assessment as learning provides a useful frame for characterising the framework's approach. While the rubrics described in this paper do support assessment of learning (they generate grades and performance records), their primary function is assessment as learning: the instruments are designed to be internationalised by students as evaluative frameworks that they apply to their own and each other's work, developing the capacity for independent professional self-assessment that is foundational to career-long reflective development.

The DTDEA instrument, in particular, is explicitly designed to serve as a cognitive tool for thinking about digital resource design rather than merely a scoring

template. Students who have applied the DTDEA to multiple peer resources over the course of a semester should, by the end, be able to approach any digital resource with the four-dimensional analytical habit that the instrument embodies – alignment, learner activation, age appropriateness, integration potential – as a matter of professional second nature rather than deliberate effort.

6.4. Limitations and Future Directions

The framework described in this paper is a design proposal and practice-based account rather than an empirical study. Its claims about effectiveness are theoretical and rationale-based rather than empirically validated. The primary limitation is therefore the absence of systematic outcome data: we do not yet have longitudinal evidence of the degree to which students who complete this course develop the dimensions of creative competence the framework targets, nor do we have evidence of transfer to classroom practice following graduation.

Future research should address this limitation through two complementary approaches: quasi-experimental comparison of assessment outcomes between cohorts taught with and without the framework, and longitudinal follow-up of graduates to assess whether the reflective, analytical, and digital competencies developed in the course persist and develop in professional contexts. Additionally, the framework was developed within a specific Uzbek higher education context and may require adaptation for use in systems with different digital infrastructure, different professional preparation traditions, or different learner populations.

A further limitation is that the framework's assessment instruments, while described with design rationale, have not yet been subject to formal validity and reliability analysis. Instrument validation – including inter-rater reliability testing for the PSOM and DTDEA rubrics – is a necessary next step before the instruments can be recommended for high-stakes assessment use. Future validation studies may employ expert review procedures to establish content validity, pilot implementation across multiple institutions to examine construct validity, and inter-rater reliability analysis to assess scoring consistency across evaluators.

7. Conclusion

This paper has presented a theoretically grounded assessment framework designed to develop and evaluate creative competence in pre-service primary school teachers. The framework integrates two purpose-designed pedagogical methods – Learning from Creative Errors and Digital Creative Tool – within an integrative pedagogical approach supported by the Padlet digital platform. The assessment instruments embedded within these methods – including the PSOM analytical tool, the TPACK Design Matrix, the DTDEA rubric, and the portfolio assessment criteria – are designed in accordance with five principles derived from the assessment and learning sciences literature: alignment, embeddedness, iteration, social visibility, and transparency.

The framework's central claim is that creative professional competence requires assessment approaches that capture process as well as product, that are embedded within rather than appended to learning activities, that create structured opportunities for revision and improvement, and that make the developmental trajectory of competence growth visible over time. These are requirements that conventional summative assessment cannot meet, and that digital portfolio-based approaches, thoughtfully designed and theoretically grounded, are well positioned to address.

The instruments and design rationale presented here are offered as a replicable contribution to practitioners and researchers working on assessment in pre-service teacher education and, more broadly, in professional higher education contexts where the development of complex, creative, and reflective competencies is the central educational aim.

Disclosure Statement

No potential conflict of interest was reported by the author.

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