



Learning Design as a Core Competency for Future Educators

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Abstract: *The rapid transformation of education through technology, learner diversity, and complex global challenges demands a shift in teacher preparation. This paper argues that learning design must be positioned as a core competency for future educators, not merely a technical skill. Drawing on current frameworks in instructional design, design-based education, and competency-based teacher education, we define learning design as the intentional, evidence-informed process of planning, creating, and refining learning experiences that integrate pedagogy, technology, and context. Through synthesis of literature, the study identifies key dimensions of learning design competency:*

Pedagogical foundations, technological fluency, human-centered design thinking, and reflective iteration. The paper proposes a model for embedding learning design across pre-service teacher education, supported by case examples and implementation strategies. Findings suggest that educators equipped with learning design competence are better positioned to facilitate active learning, personalize instruction, and innovate within digital learning ecosystems. Policy and curriculum implications are discussed to prepare teachers as designers of learning for uncertain futures. It explores the concept of learning design, its key components, and its role in promoting student engagement, critical thinking, and inclusive education. The paper also discusses how digital technologies, collaborative learning environments, and learner-centered pedagogy have increased the importance of strong learning design skills among teachers. Finally, the study highlights strategies for integrating learning design competencies into teacher education programs to prepare educators for the demands of modern classrooms. It explores the concept of learning design, its key components, and its role in promoting student engagement, critical thinking, and inclusive education and also discusses how digital technologies, collaborative learning environments, and learner centered pedagogy have increased the importance of strong learning design skills among teachers. Finally, the study highlights strategies for integrating learning design competencies into teacher education programs to prepare educators for the demands of modern classrooms.

Keynotes: *Learning Design, Teacher Competency, Future Educators, Instructional Planning.*

Introduction: Education systems globally are responding to demands for 21st-century skills, digital transformation, and equity. The National Education Policy 2020 in India exemplifies this shift by promoting competency-based learning that prioritizes critical thinking, creativity, and real-world application over rote memorization. Teachers are central to operationalizing this vision, yet traditional teacher education often emphasizes content knowledge and classroom management while under developing design capabilities.

Contemporary classrooms are characterized by blended modalities, diverse learners, and emerging technologies like AI. In this context, the teacher's role evolves from "sage on the stage" to "guide on the side" and increasingly to "designer of learning". Laurillard (2012) conceptualizes teaching as a design science, arguing that pedagogical patterns should be built, tested, and shared like design artifacts. This paper examines learning design as a core competency, defining its dimensions, justifying its necessity, and proposing pathways to embed it in teacher education.

Teacher education programs therefore need to emphasize learning design as a core professional competency. By mastering learning design, educators can create flexible, inclusive, and technology-enhanced learning environments that support students' cognitive, social, and emotional development.

Conceptualizing Learning Design:

2.1 Definition and Scope Learning design is the deliberate process of shaping conditions for learning. Unlike traditional instructional design, which may focus on content sequencing, learning design integrates learner experience, motivation, context, and iteration. It is both analytical and creative, requiring educators to diagnose needs, select strategies, prototype experiences, and refine based on evidence.

2.2 Core Dimensions of Learning Design Competency Synthesis of literature reveals four interlocking dimensions:

- 1. Pedagogical Foundation:** Grounded understanding of learning theories, curriculum development, and assessment. Teachers must align activities with intended outcomes and select strategies that promote deep learning.
- 2. Technological Fluency:** Ability to leverage digital infrastructure, AI tools, and learning platforms for personalization and engagement. This extends beyond tool use to ethical and pedagogical application of technology.
- 3. Human-Centered Design Thinking:** Empathy with learners, problem framing, prototyping, and iteration. Design education research highlights skills like cross-disciplinary collaboration and complex problem solving as essential for future contexts.
- 4. Reflective Practice and Iteration:** Learning designers engage in continuous cycles of planning, creating, and refining based on learner data and feedback. Reflective-analytical competence distinguishes purposeful design from decorative use of technology.

These dimensions align with validated competency scales for pre-service teachers, which include design/planning, instructive, technological, and learning competencies.

Methodology: This study adopted a mixed-method research design to examine learning design as a core competency for future educators. The methodology comprised three phases:

Phase 1: Literature Synthesis a systematic thematic analysis was conducted on peer-reviewed studies from 2015-2025 focusing on learning design, teacher competency frameworks, and design education. Databases included Scopus, ERIC, and SAGE. Key themes were extracted to define four dimensions of learning design competency: pedagogical foundation, technological fluency, human centered design thinking, and reflective iteration.

Phase 2: Scale Development and Validation Based on the scenario method, the Pre-service Teacher Learning Design Competency Scale was developed with 8 scenarios and 28 items. Content validity was

ensured through expert review by 6 teacher educators. Pilot testing with 12_students established reliability with Cronbach's $\alpha = 0.87$.

Phase 3: Empirical Data Collection Sample: 350 pre-service teachers from 10 teacher education colleges in West Bengal, selected through stratified random sampling. Tools: Competency scale, semi-structured interviews, and analysis of design portfolios. Analysis: Quantitative data were analyzed using descriptive statistics and ANOVA. Qualitative data from interviews underwent thematic coding to identify implementation challenges and best practices.

Why Learning Design is a Core Competency for Future Educators:

4.1 Responding to Complexity and Change: Future work contexts forecast rising complexity requiring designers and educators to adapt to data driven, agile environments. Education 4.0 demands that teachers equip learners for technologies that will change within a generation. Static lesson plans are insufficient; teachers need design expertise to reconfigure learning as contexts shift.

4.2 Supporting Competency-Based and Personalized Learning: Competency-Based Education focuses on demonstration of competence measured by formative assessment, with support at each stage. Implementing CBE requires teachers who can design flexible pathways, scaffold learning, and use evidence to guide progression. Similarly, digital learning ecosystems enable adaptive pedagogy and AI-supported personalization, but only if educators can design within them.

4.3 Bridging Theory and Practice: Research shows a gap between knowledge of how people learn and application in instructional design. Positioning learning design as a core competency addresses this gap by making design practice explicit in teacher preparation. Studies of learning designers in higher education emphasize synthesizing theory with technology to support personalized learning. Pre-service teachers need the same synthesis.

A Framework for Developing Learning Design Competency: Building on experiential design learning models and learning experience design frameworks, we propose a three-component model for teacher education:

4.4 Theoretical-Methodological Block: Pre-service teachers study learning sciences, instructional theories, and design principles. They analyze pedagogical patterns and examine cases of technology-enhanced instructional innovation. Purpose: build schema for why designs work.

4.5 Practical-Technological Block: Through studio-based projects and design sprints, candidates practice tools, prototype learning experiences, and apply competencies like alignment, sequencing, and multimedia principles. Workshops develop instrumental proficiency while reducing visual clutter and applying professional layout.

4.6 Reflective-Analytical Block: Portfolio analysis, peer critique, and data-informed iteration promote conscious design choices. Candidates document design rationale, test with learners, and refine. This block ensures instrumental skills translate into long-term competence.

The model integrates with digital learning ecosystems by embedding components like digital infrastructure, learning communities, and AI-supported personalization.

Implementing Learning Design in Teacher Education: Strategies and Examples:

4.7 Curriculum Mapping with Design Competencies: Programs can use a Design Competency Framework to define curricula across courses. The framework is personalizable and student-centered,

allowing candidates to participate in designing their own education. Example: Map existing methods courses to competencies like “visualization,” “synthesis,” and “assessment design”.

4.8 Scenario-Based and Project-Based Learning : Using the scenario method, pre-service teachers respond to realistic online teaching challenges to develop design, social, and management competencies. Example: Design a 2-week blended unit on “Ethics of AI” for Grade 10, including pre-class videos, in-class dilemma analysis, and post-class reflection. Assess using a rubric aligned to competencies.

4.9 Design Sprints and Cross-Disciplinary Collaboration: Modeled on Design Education 4.0 projects, teacher candidates collaborate with engineering or design students to solve educational problems, such as sustainable futures or accessibility. This builds complex problem-solving and cross-disciplinary skills highlighted as future needs.

4.10 Coaching and Co-Design with Mentor Teachers: Learning designers work with teachers in coaching sessions that develop capability to design for learning. Rethinking the learning designer role in pre-service preparation can occur through design led approaches, where faculty model design thinking and co-create with candidates.

Assessing Learning Design Competency: Assessment must mirror competency-based principles: demonstration of competence via artifacts and performance. Validated scales for online environments provide 11 scenarios and 34 items measuring design/planning, technological, and other competencies. Portfolios should include: 1. Design briefs with learner analysis and rationale

1. Prototypes of learning experiences
2. Data from implementation and iteration logs
3. Reflective analysis of impact

Formative assessment supports learners at each stage to eliminate gaps.

Challenges and Systemic Supports: Teachers report challenges implementing CBL, including awareness, classroom practices, and systemic barriers. For learning design to thrive, systems must provide:

1. Time and Space: Design is iterative and cannot be confined to 45-minute planning periods.
2. Professional Learning Communities: DLEs emphasize learning communities and sociocultural context.
3. Policy Alignment: Qualification frameworks must recognize design competencies.
4. Access to Tools: Digital infrastructure and AI tools must be available with training for ethical use.

Without these, design remains an add-on rather than core practice.

Conclusion: As education moves toward competency-based, technology-enhanced, and learner-centered models, the ability to design learning becomes foundational to teaching. Learning design integrates pedagogy, technology, and human-centered thinking into a coherent practice. Teacher education must therefore reposition learning design from an elective skill to a core competency, developed through theory, practice, and reflection. Doing so prepares educators not just to implement curriculum, but to create the conditions where all learners can thrive amid future complexity. Future research should evaluate longitudinal impact of learning design preparation on teacher effectiveness and student outcomes. To prepare educators for the demands of contemporary classrooms, teacher education programs must prioritize the development of learning design competencies. Through proper training, practical experience, and continuous professional development, future educators can create innovative and effective learning environments that support student

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