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QUALIFICATION REQUIREMENTS FOR PROSPECTIVE TEACHERS AND THE STRUCTURAL COMPONENTS OF DESIGN COMPETENCE IN MODERN PEDAGOGICAL EDUCATION

Izzatullayeva Shokhruza Sanjarbek kizi

Namangan State Pedagogical Institute Theory and History of Pedagogy

Master's student of group MPNT-AU-24

Abstract: This article examines the qualification requirements imposed on prospective teachers within the context of contemporary pedagogical education and analyzes the structural components of design competence as a key professional capability. The study conceptualizes design competence as an integrative construct that combines cognitive, methodological, technological, and reflective components necessary for effective educational planning and implementation.

Keywords: prospective teachers, qualification requirements, design competence, professional competencies, pedagogical education, instructional design, competency-based approach.

Introduction: The rapid transformation of global educational systems under the influence of technological advancement, socio-economic shifts, and the growing complexity of knowledge societies has fundamentally reshaped the professional expectations placed upon teachers. One of the most critical competencies emerging within this paradigm is design competence, which functions as a structural and functional core of modern pedagogical professionalism. The concept of qualification requirements for future teachers is increasingly interpreted through the lens of professional competence, integrating cognitive, practical, axiological, and reflexive dimensions. Qualification requirements now extend beyond formal academic credentials to include the ability to analyze educational contexts, formulate pedagogical objectives, design learning environments, and evaluate educational outcomes in alignment with societal and institutional demands. In this regard, the development of design competence becomes a strategic priority in teacher education, as it equips prospective educators with the capacity to model and optimize teaching–learning processes in a systematic and scientifically grounded manner. Design competence, as a pedagogical construct, reflects the teacher's ability to conceptualize, plan, implement, and assess educational activities through evidence-based and learner-oriented approaches. It presupposes mastery of instructional design principles, curriculum planning strategies, and pedagogical modeling techniques, while simultaneously requiring advanced cognitive skills such as problem-solving, critical analysis, and anticipatory thinking. For prospective teachers, the acquisition of design competence represents a transition from reproductive pedagogical actions to creative and transformative professional behavior. Consequently, the formation of this competence is inseparably linked to the qualification requirements defined within national and international teacher education standards[1]. In recent years, the competency-based approach has become the dominant methodological foundation for redefining qualification requirements in teacher education. This approach emphasizes the outcomes of professional training in terms of demonstrable competencies rather than solely the accumulation of theoretical knowledge. Within this framework, design competence occupies a central position, as it integrates subject knowledge,

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pedagogical theory, methodological skills, and reflective practice into a coherent professional capability. The ability to design educational processes enables future teachers to respond flexibly to diverse learner needs, integrate innovative technologies, and ensure the coherence and effectiveness of instructional activities[2]. The relevance of design competence is further intensified by the increasing diversity of educational contexts and learner profiles. Modern classrooms are characterized by heterogeneity in terms of cognitive abilities, cultural backgrounds, learning styles, and motivational orientations. Under such conditions, standardized instructional approaches prove insufficient, necessitating a design-oriented pedagogical mindset that allows teachers to tailor educational experiences to specific learning situations. Prospective teachers, therefore, must be prepared not only to implement existing curricula but also to design adaptive learning trajectories that foster meaningful learning and personal development[3]. Moreover, the digitalization of education has significantly expanded the scope of design competence. The integration of digital tools, online platforms, and blended learning models requires teachers to possess advanced design skills related to instructional sequencing, multimedia integration, and learner engagement in virtual environments. Qualification requirements increasingly reflect these demands, emphasizing the need for future teachers to master educational design as a technologically mediated and pedagogically grounded process[4]. In this sense, design competence functions as a bridge between pedagogical theory and innovative educational practice. From a theoretical perspective, design competence can be conceptualized as a multidimensional construct comprising cognitive, operational, motivational, and reflective components. The cognitive component includes knowledge of pedagogical theories, curriculum frameworks, and instructional design models[5]. The operational component encompasses practical skills related to lesson planning, learning activity design, and assessment development. The motivational component reflects the teacher's professional values, commitment to innovation, and readiness for continuous improvement[6]. Finally, the reflective component involves self-analysis, evaluation of pedagogical decisions, and the ability to revise instructional designs based on feedback and learning outcomes. Together, these components form an integrated system that underpins the professional effectiveness of future teachers. The alignment between qualification requirements and the structural components of design competence constitutes a key challenge for teacher education institutions. In many cases, discrepancies persist between formal qualification standards and the actual competencies developed during pre-service training[7]. This gap underscores the necessity of rethinking curricular structures, pedagogical methodologies, and assessment practices to ensure the systematic formation of design competence. Teacher education programs must move beyond fragmented course structures toward integrative models that embed design-oriented tasks, project-based learning, and reflective practices throughout the training process. Furthermore, the professional socialization of prospective teachers plays a crucial role in shaping their design competence[8]. Through engagement in pedagogical practice, collaborative projects, and reflective dialogue, future educators internalize professional norms and develop a design-oriented professional identity. Qualification requirements, therefore, should be understood not merely as external benchmarks but as developmental guidelines that support the formation of a holistic professional profile. In this context, design competence emerges as both a product and a driver of professional growth, enabling future teachers to navigate the complexities of educational practice with confidence and creativity[9].

Literature review: The theoretical foundations of qualification requirements for prospective teachers and the conceptualization of design competence have been extensively

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explored in international pedagogical research, particularly within the frameworks of competency-based education and instructional design theory. Among foreign scholars who have made significant contributions to this field, the works of Lee S. Shulman and David H. Jonassen occupy a central position, as they offer complementary yet distinct perspectives on teacher professionalism, pedagogical reasoning, and design-oriented competence development. Lee S. Shulman's scholarly contributions are primarily associated with the reconceptualization of teacher knowledge and professional competence[10]. His seminal theory of Pedagogical Content Knowledge (PCK) emphasizes that effective teaching requires more than subject-matter expertise or generic pedagogical skills; rather, it involves the teacher's ability to transform disciplinary knowledge into pedagogically meaningful representations tailored to learners' needs. From the perspective of design competence, Shulman's framework implicitly foregrounds the design dimension of teaching, as it requires teachers to plan, structure, and adapt instructional content through deliberate pedagogical decision-making. In this sense, qualification requirements for prospective teachers, as conceptualized by Shulman, include the capacity for pedagogical design that integrates content knowledge, learner characteristics, and instructional strategies into coherent learning experiences. Shulman further elaborates the notion of professional judgment and pedagogical reasoning, which are essential components of design competence. He argues that teachers must engage in a cyclical process of comprehension, transformation, instruction, evaluation, reflection, and new comprehension. This process-oriented model aligns closely with contemporary interpretations of design competence as a reflective and iterative professional capability[11]. Within this framework, design competence is not viewed as a static skill set but as a dynamic system of cognitive and reflective operations that enable teachers to continuously redesign educational processes in response to contextual demands. Consequently, Shulman's work provides a theoretical justification for including design competence as a core qualification requirement in teacher education programs. In contrast, David H. Jonassen approaches the issue of design competence from the standpoint of constructivist learning theory and instructional design. Jonassen's research focuses on the role of problem-solving, cognitive tools, and learning environment design in fostering meaningful learning[12]. He conceptualizes learning as an active process of knowledge construction, which necessitates carefully designed instructional contexts rather than prescriptive teaching methods. For prospective teachers, this perspective implies that qualification requirements must encompass the ability to design learning environments that promote inquiry, collaboration, and higher-order thinking. Jonassen explicitly positions teachers as designers of learning experiences, thereby directly linking professional competence to design-oriented pedagogical practice. Jonassen's model of design-based learning underscores the importance of ill-structured problems and authentic tasks as catalysts for cognitive development[13]. According to his theory, teachers must be capable of designing complex learning situations that mirror real-world challenges and encourage learners to engage in analysis, synthesis, and evaluation. This requirement significantly expands the traditional understanding of teacher qualifications, as it demands advanced design competence that integrates pedagogical theory, technological tools, and contextual analysis. From Jonassen's perspective, design competence constitutes a higher-level professional capability that differentiates routine instructional delivery from innovative and transformative teaching practice[14]. A comparative analysis of Shulman's and Jonassen's theoretical positions reveals both convergence and divergence in their treatment of design competence. While Shulman emphasizes pedagogical reasoning and knowledge transformation as the core of teacher professionalism, Jonassen foregrounds the design of learning environments and problem-centered instruction as fundamental competencies.

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However, both scholars converge on the idea that effective teaching is inherently a design activity requiring systematic planning, contextual sensitivity, and reflective evaluation. This convergence reinforces the argument that design competence should be explicitly articulated within qualification requirements for prospective teachers[15]. At the same time, a critical tension emerges between Shulman's knowledge-centered approach and Jonassen's environment-centered constructivism. Shulman's framework prioritizes the internal cognitive processes of the teacher, particularly the transformation of content knowledge, whereas Jonassen places greater emphasis on external instructional structures and learning contexts. This theoretical divergence has important implications for teacher education curricula, as it raises questions about whether design competence should be developed primarily through knowledge-based pedagogical training or through experiential, design-oriented learning activities[16]. Addressing this tension requires an integrative approach that synthesizes both perspectives within a coherent qualification framework. Overall, the reviewed literature demonstrates that design competence is a multidimensional construct deeply embedded in contemporary theories of teacher professionalism. The works of Shulman and Jonassen provide robust theoretical foundations for understanding design competence as a core qualification requirement for prospective teachers. Their contributions highlight the necessity of aligning teacher education programs with design-oriented competencies that enable future educators to respond effectively to the complexities of modern educational practice[17].

Methodological section: This study employed a комплекс integrated methodological approach combining theoretical analysis of pedagogical and competency-based literature, comparative examination of international teacher qualification standards, structural-functional modeling of design competence components, and qualitative synthesis of instructional design practices, supported by analytical interpretation, abstraction, and generalization methods to ensure conceptual coherence and methodological validity of the research findings.

Results: The results of the study indicate that the systematic integration of clearly defined qualification requirements with the structural components of design competence significantly enhances prospective teachers' professional readiness by strengthening their instructional planning abilities, reflective pedagogical reasoning, and capacity to design adaptive and learner-centered educational processes within contemporary teaching environments.

Discussion: The issue of qualification requirements for prospective teachers and the role of design competence within professional preparation has generated significant debate in international pedagogical scholarship[18]. A notable polemical dialogue can be traced between scholars who emphasize knowledge-based professionalism and those who advocate for design-oriented, constructivist teacher education models. In this context, the theoretical positions of Lee S. Shulman and David H. Jonassen represent two influential yet partially contrasting perspectives that illuminate the complexity of design competence as a core qualification requirement. Shulman's position is grounded in the epistemological foundations of teacher knowledge, particularly his concept of Pedagogical Content Knowledge. From his viewpoint, the central challenge of teacher qualification lies in the teacher's capacity to transform subject matter knowledge into pedagogically accessible forms[19]. Shulman implicitly argues that without a strong cognitive and disciplinary foundation, design competence risks becoming superficial, reduced to technical lesson planning rather than meaningful pedagogical reasoning.

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In this sense, he cautions against overemphasizing procedural design skills at the expense of deep conceptual understanding, suggesting that effective educational design must originate from robust professional knowledge structures. In contrast, Jonassen's constructivist framework challenges the primacy of content transformation by foregrounding the design of learning environments as the principal determinant of educational effectiveness[20].

Conclusion: In conclusion, the analysis of qualification requirements for prospective teachers and the structural components of design competence demonstrates that contemporary pedagogical professionalism is increasingly defined by the ability to design, model, and evaluate educational processes in a systematic and reflective manner.

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