

METHODOLOGICAL PREPARATION TECHNOLOGY FOR FUTURE TEACHERS OF THE SUBJECT “EDUCATION” FOR INTEGRATIVE TEACHING

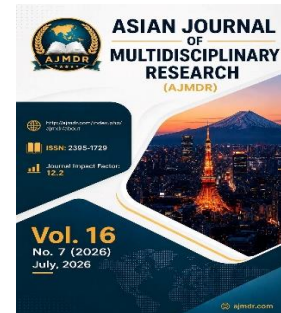
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Abstract This study examines the methodological preparation of future teachers of the subject “Education” for integrative teaching. It focuses on interdisciplinary learning, lesson design, practical activities, and reflection as key conditions for improving methodological readiness. The study shows that systematic integrative preparation can strengthen future teachers’ professional and methodological competence. **Keywords** integrative teaching, future teachers, methodological preparation, interdisciplinary learning, pedagogical competence, lesson design, teacher education.

Introduction

Contemporary education increasingly requires teachers to move beyond isolated subject instruction and to organize learning around interconnected knowledge, values, skills, and practical experiences. This requirement is especially important for future teachers of the subject “Education,” because the content of education is inherently interdisciplinary. It includes moral development, civic responsibility, social interaction, communication, cultural awareness, ecological consciousness, media literacy, and personal self-development. Therefore, preparing future teachers for this subject cannot be limited to mastering separate methodological techniques. It should develop an integrated methodological readiness that enables teachers to connect educational content with learners’ real-life experiences and with knowledge from other subjects. Integrative teaching is understood in this study as a purposeful pedagogical process in which concepts, skills, values, learning activities, and assessment procedures from related educational areas are connected around a common learning objective. The purpose of integration is not simply to combine several subjects in one lesson. Rather, it is to establish meaningful relationships among learning components so that students can perceive a phenomenon as a coherent system. Uzbek pedagogical scholarship has repeatedly emphasized the importance of interdisciplinary connections and integrated learning. Abdullayeva’s research on interdisciplinary relationships, as well as the works of Mavlonova and Rahmonqulova on integrated pedagogy, demonstrate that integration can strengthen the systematic character of learning and support a holistic understanding of



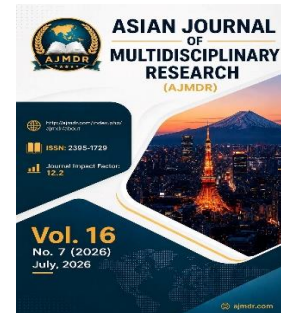
educational content. Recent Uzbek studies also consider integrative approaches as an important condition for developing professional and research competencies.

The methodological preparation of future teachers is therefore a key condition for successful implementation of integrative teaching. A teacher may recognize the value of integration but still experience difficulties in selecting content, designing interdisciplinary tasks, coordinating teaching methods, applying digital tools, and assessing integrated learning outcomes. The methodological readiness of a future teacher should consequently include several interrelated components: motivational-value readiness, conceptual knowledge, methodological skills, technological competence, reflective ability, and the capacity to design interdisciplinary learning situations. The development of these components requires a coherent pedagogical technology rather than a collection of unrelated exercises.

The relevance of this problem is also associated with changes in the role of the teacher. In a traditional model, the teacher is mainly a transmitter of subject knowledge. In an integrative model, the teacher becomes a designer of learning environments, a facilitator of interdisciplinary inquiry, and an organizer of collaborative and reflective activity. For future teachers of “Education,” this transformation is particularly significant because educational lessons should connect knowledge with behavior, personal experience, social responsibility, and practical decision-making. An effective methodological preparation technology must therefore train prospective teachers to design lessons in which cognitive, emotional, social, and value-oriented dimensions reinforce each other. The purpose of this study is to substantiate a pedagogical technology for improving the methodological preparation of future teachers of the subject “Education” for integrative teaching. The study focuses on the structure of methodological readiness, the pedagogical conditions that support its development, and the indicators that can be used to evaluate changes in students’ preparedness for integrative lesson design. The study is guided by the following research questions: What components constitute methodological readiness for integrative teaching? Which pedagogical conditions most effectively support its development? How can the effectiveness of the proposed technology be evaluated in teacher education?

Methods

The study employed a mixed methodological design combining theoretical analysis, pedagogical modelling, diagnostic assessment, and analysis of student-produced methodological materials. The theoretical stage included analysis of Uzbek pedagogical literature devoted to interdisciplinary relationships, integrated pedagogy, professional competence, and modern educational technologies. Particular attention was given to works by Uzbek researchers who have examined



integration in primary education, teacher preparation, interdisciplinary learning, and competency development. This analysis was used to define the conceptual structure of methodological readiness for integrative teaching.

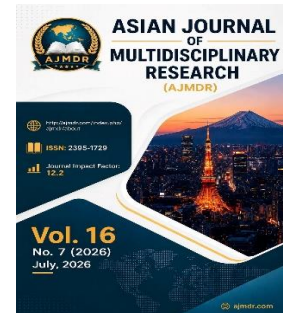
The pedagogical modelling stage was used to construct a technology consisting of four consecutive phases: diagnostic-motivational, conceptual-methodological, design-practical, and reflective-evaluative. The first phase identifies students' initial understanding of integration and their motivation to use interdisciplinary methods. The second phase develops conceptual knowledge about integration, interdisciplinary links, learning objectives, and pedagogical design. The third phase focuses on practical design of integrative lessons, learning tasks, projects, and assessment tools. The fourth phase develops reflection, peer evaluation, self-assessment, and revision of methodological products.

The participants in the model-based pedagogical work were future teachers studying pedagogical disciplines. For diagnostic purposes, methodological readiness was assessed through four indicators: understanding of integrative teaching; ability to identify meaningful interdisciplinary links; ability to design integrative learning activities; and ability to assess integrated learning outcomes. Each indicator was evaluated on a three-level scale: low, medium, and high. The diagnostic instrument included a short conceptual test, a lesson-design task, an interdisciplinary-task construction exercise, and a reflective questionnaire.

The central methodological instrument was an integrative lesson-design matrix. The matrix required students to specify: the central educational problem; learning outcomes; concepts from the main subject; relevant connections with other subjects; learner activities; teaching methods; digital or visual resources; expected behavioral or value-oriented outcomes; and assessment criteria. The matrix was deliberately designed to prevent superficial integration. Students were required to explain why each interdisciplinary connection was pedagogically necessary and how it contributed to the common learning objective.

During the practical stage, students worked individually and in small groups. Individual work focused on the development of lesson plans and methodological tasks. Group work was organized around educational cases such as environmental responsibility, digital citizenship, healthy communication, cultural diversity, responsible decision-making, and civic participation. These cases were selected because they naturally require knowledge and skills from several domains. For example, an environmental responsibility lesson could integrate "Education" with biology, geography, mathematics, information technology, and language communication.

The effectiveness of the technology was assessed through comparative analysis of students' methodological products before and after the intervention



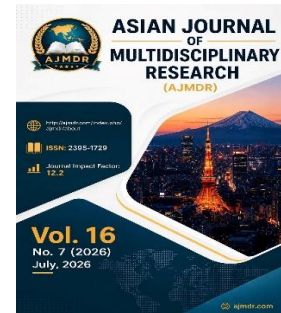
model. A rubric was used to evaluate five dimensions: coherence of interdisciplinary links, methodological appropriateness, learner activity, integration of values and practical skills, and assessment validity. The rubric used a five-point scale for each dimension. In addition, qualitative analysis of reflective responses was conducted to identify changes in students' understanding of the teacher's role in an integrated learning environment.

The study also applied principles of systematicity, learner-centeredness, activity, contextualization, reflection, and professional orientation. Ethical considerations included voluntary participation in diagnostic activities, use of anonymized student work, and presentation of results in aggregated form. Since the main purpose was methodological modelling rather than experimental generalization, the findings are interpreted primarily as pedagogical evidence supporting the proposed technology and as a basis for further empirical testing.

Results

The theoretical analysis showed that methodological readiness for integrative teaching can be represented as a multidimensional construct. The first component is motivational-value readiness, which reflects the future teacher's understanding of why integration is needed and willingness to organize learning around meaningful connections. The second component is conceptual readiness, which includes knowledge of integration, interdisciplinary relationships, pedagogical principles, and the logic of curriculum coherence. The third component is operational readiness, expressed through the ability to select methods, construct tasks, organize collaboration, and use digital resources. The fourth component is reflective readiness, which enables the teacher to evaluate the quality of integration and improve lesson design.

The diagnostic stage indicated that students generally recognized the importance of interdisciplinary teaching but tended to interpret integration as the simple inclusion of information from another subject. This finding is consistent with the pedagogical problem identified in Uzbek literature: interdisciplinary connection becomes educationally meaningful only when it contributes directly to a common objective and supports a coherent learning activity. Students found it easier to identify thematic similarities between subjects than to design tasks in which learners had to apply knowledge from several areas to solve one problem. This distinction became a central focus of the practical stage. The proposed technology changed students' approach to lesson planning in several ways. First, students began to formulate a central learning problem before selecting additional subject connections. Second, they increasingly treated interdisciplinary content as a means of developing competencies rather than as additional information. Third, students paid greater

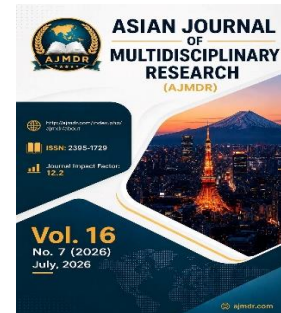


attention to learner activity, including discussion, project work, problem solving, reflection, and collaborative decision-making. Fourth, assessment criteria became more closely connected with the integrated learning outcomes rather than with the reproduction of isolated facts.

The lesson-design matrix proved especially useful for improving methodological coherence. Before using the matrix, many student plans contained several subject references but lacked a clear relationship among objectives, activities, and assessment. After repeated use of the matrix, methodological products demonstrated stronger alignment. Students more frequently explained the pedagogical purpose of each interdisciplinary element and selected tasks that required learners to compare, classify, analyze, communicate, create, and make decisions. The matrix also helped future teachers distinguish between integration and simple parallel teaching. The practical work demonstrated that the subject “Education” has considerable potential for integrative teaching because its learning outcomes concern not only knowledge but also attitudes, values, communication, social behavior, and practical action. For example, a lesson on responsible digital behavior can connect educational content with information technology, language, psychology, law, and civic education. Students can analyze a digital communication case, identify ethical and legal risks, formulate recommendations, and present a collective code of responsible online behavior. Such a lesson simultaneously develops knowledge, communication, critical thinking, and responsible behavior. Another result concerned the role of project-based learning. When students were asked to develop small interdisciplinary projects, they demonstrated greater awareness of the relationship between educational objectives and real-life contexts. Projects such as “Safe and Responsible Digital Community,” “My Ecological Responsibility,” and “Culture of Respect in the School Community” required learners to collect information, discuss alternatives, formulate recommendations, and present products. Future teachers reported that project activities made integration more concrete because the interdisciplinary links emerged from the problem rather than being artificially added to the lesson.

The reflective stage revealed an important shift in students’ professional understanding. At the beginning, methodological preparation was often associated with knowledge of teaching methods. At the end, students increasingly described methodological competence as the ability to design a complete learning environment in which objectives, content, methods, communication, resources, and assessment form a coherent system. This shift is important because integrative teaching depends on design thinking and pedagogical decision-making rather than on the mechanical use of individual methods.

The rubric-based analysis showed the greatest qualitative improvement in three

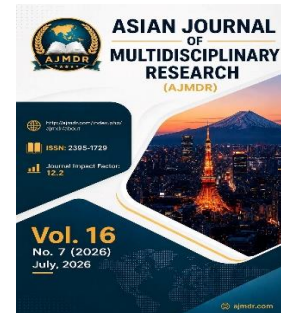


areas: formulation of interdisciplinary tasks, alignment between activities and learning outcomes, and integration of value-oriented outcomes. Improvement was more moderate in assessment design. Students could create engaging integrated activities but initially found it difficult to formulate measurable criteria for outcomes involving attitudes, communication, and social behavior. This result suggests that assessment literacy should receive greater attention in future methodological preparation programmes.

The overall results support a model in which methodological preparation develops progressively from understanding integration to designing, implementing, evaluating, and improving integrated learning. The technology can therefore be represented as a cycle rather than a linear sequence: diagnosis informs conceptual preparation; conceptual preparation supports design; design leads to practice; practice generates reflection; and reflection produces improved design. Such cyclicity is particularly appropriate for teacher education because professional competence develops through repeated interaction between theory and practice.

Discussion

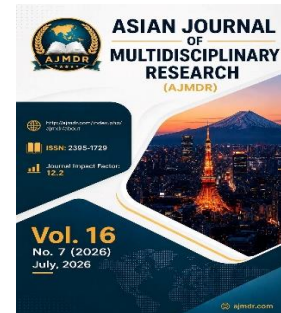
The results indicate that preparing future teachers for integrative teaching requires a shift from method-centered training to pedagogical design. Uzbek researchers have emphasized the importance of interdisciplinary relationships and integrated pedagogy, while more recent studies have connected integrative approaches with professional competence, research activity, and creative thinking. The present model develops these ideas by focusing specifically on the methodological preparation of future teachers of “Education” and by organizing preparation as a structured technology with diagnostic, design, practical, and reflective stages. One important theoretical implication is that integration should be understood as a relationship among learning purposes rather than merely as a relationship among subjects. A lesson becomes integrative when knowledge from different domains is mobilized to achieve a common educational outcome. This principle helps avoid one of the most common weaknesses of interdisciplinary teaching: decorative integration. If information from another subject is included without changing the learner’s activity or contributing to the central objective, the lesson remains essentially disciplinary. The methodological matrix developed in this study addresses this problem by requiring a clear justification for every interdisciplinary element. The findings also support the view that the subject “Education” is especially suitable for integrative learning. Unlike subjects whose outcomes are primarily conceptual, education-oriented learning aims at the development of attitudes, social skills, values, responsible behavior, and decision-making. These outcomes are naturally connected with language, history, law,



psychology, biology, information technology, culture, and civic studies. Therefore, future teachers should be prepared to identify educational problems that cross disciplinary boundaries and to transform those problems into meaningful learning tasks. The role of reflection deserves particular attention. Without reflection, students may learn to reproduce an integrative lesson template without understanding why the integration works. Reflection enables future teachers to ask whether the selected subjects are genuinely connected, whether learners are active, whether the task requires transfer of knowledge, and whether assessment measures the intended outcomes. In this sense, reflective competence functions as a quality-control mechanism within methodological preparation.

The findings correspond with Uzbek research emphasizing that integration supports systematic and holistic learning. Abdullayeva's work on interdisciplinary relationships provides a theoretical basis for understanding connections among learning components, while Mavlonova and Rahmonqulova's work on integrated pedagogy demonstrates the importance of organizing content around meaningful relationships. Studies by Abduquddusov, Isaqulova, and other Uzbek researchers further show that integrative approaches can support deep learning, ecological education, professional development, and competency formation. Recent research also connects integration with creative and analytical thinking and with the methodological preparation of future teachers. At the same time, several limitations should be recognized. First, the study is primarily methodological and model-based; therefore, its findings should not be interpreted as universal causal evidence. Second, the assessment of methodological readiness relies partly on student-produced materials and reflective responses, which may contain subjective elements. Third, successful implementation depends on curriculum flexibility, teacher educators' expertise, availability of digital resources, and cooperation among subject teachers. Future research should therefore test the proposed technology through larger-scale experimental studies and compare its effects across different teacher education programmes.

The practical implication is that teacher education institutions should integrate interdisciplinary lesson design into regular methodological courses rather than treat it as an optional activity. Students should repeatedly design, teach, observe, assess, and revise integrative lessons. Microteaching, peer review, project work, digital portfolios, case analysis, and reflective journals can provide an effective environment for this process. Teacher educators should also model integration in their own university classes so that students experience the approach as learners before applying it as teachers. The study further suggests that assessment of future teachers should include the quality of methodological design, not only theoretical knowledge. A prospective teacher who can define integration but cannot construct

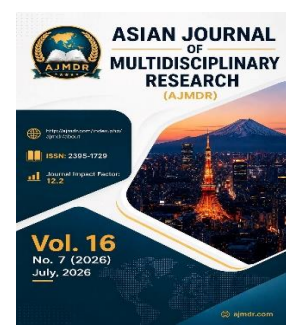


an appropriate task has incomplete methodological readiness. Assessment should therefore examine the coherence of objectives, interdisciplinary content, learner activity, resources, assessment criteria, and reflection. Such an approach would make teacher preparation more closely aligned with the real demands of contemporary school practice.

Overall, the proposed pedagogical technology provides a structured way to improve future teachers' readiness for integrative teaching of the subject "Education." Its central principle is coherence: educational goals, interdisciplinary content, learning activities, values, technologies, and assessment should operate as mutually reinforcing elements. The model transforms integration from a general pedagogical slogan into a practical professional competence that can be taught, practiced, assessed, and continuously improved.

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