

**PEDAGOGICAL CONDITIONS FOR USING DIGITAL EDUCATIONAL TECHNOLOGIES TO
DEVELOP THE PROFESSIONAL COMPETENCE OF PROSPECTIVE MATHEMATICS TEACHERS****Nasriddinova Halima Farhod qizi****New Star School****Mathematics teacher****nasriddinova_halima@buxdpi.uz****ORCID: 0009-0009-7320-5422**

Abstract: Pedagogical conditions must be coordinated if digital educational technologies are to support the development of prospective mathematics teachers' professional competence. Clear learning objectives, alignment between mathematical content and digital tools, active student participation, individual support, connections across subjects and meaningful assessment form the basis of these conditions. Methodological support and an accessible digital environment enable students to connect mathematical knowledge with pedagogical decisions. The importance of these conditions in professional preparation lies in explaining content, organising learning activities and justifying independent instructional choices.

Key words: professional competence, prospective mathematics teacher, digital educational technologies, pedagogical conditions, methodological preparation, individual support, connections across subjects, assessment.

Introduction. The professional preparation of prospective mathematics teachers combines acquiring mathematical knowledge with applying it thoughtfully in teaching. Digital technologies offer opportunities to represent content, organise learning activities and work with responses. Whether these opportunities support professional development depends on how the educational process is organised. Alongside learning to operate a tool, students need to explain the mathematical and pedagogical reasons for using it. Pedagogical conditions are therefore regarded as factors that align the objectives, content and activities of preparation for teaching with digital technologies.

Pedagogical conditions encompass requirements for organising a learning environment that supports the development of professional competence. They concern clear objectives, academically sound content, professionally oriented tasks and support appropriate to learning needs. The availability of a particular tool does not ensure that these requirements are met. Technical capabilities acquire pedagogical significance when connected with explaining content and organising independent thinking. These conditions should therefore be considered together within the overall structure of educational activity. Works on mathematics teaching methodology by S. Alixonov and D.I. Yunusova provide learning resources for prospective teachers' subject and methodological preparation. The work on mathematics teaching technologies and design by M. Barakayev, M. Tojiyev, D. Yunusova and K. Mamadaliyev is also relevant to this area. Works by A.A. Xoliqov and by O'Q. Tolipov and M. Usmonboyeva are used to study the general pedagogical aspects of professional preparation. When digital tools are employed, the requirements of mathematics teaching methodology and pedagogical practice need to remain aligned. The first condition is to define learning objectives in accordance with professional activity. The mathematical content students should understand, the learning activities they should organise and the way they

should justify their choices are specified in advance. An objective includes both operating a tool and the pedagogical task performed through its use. Learning tasks and assessment requirements are designed accordingly. Clear objectives provide a basis for students to plan their activities and check whether a completed teaching design fulfils its professional purpose.

The second condition is to align mathematical content with the didactic capabilities of digital tools. Tool selection takes account of the essential features of a concept, its forms of representation and the cognitive actions needed to understand it. A digital representation should accurately reflect mathematical content, reveal key relationships and support students' explanations. The availability of a technical function does not in itself justify using it. Prospective teachers need to explain the tool's role in a particular learning task and the limits of the conclusions that can be drawn from it. Mathematical accuracy is an essential requirement for aligning content. Logical consistency between definitions, notation, conditions of application and conclusions must be maintained. Representations in a digital environment should be connected with mathematical justification, and the roles of observation and proof should be distinguished. Alongside checking the accuracy of material, students consider how pupils might interpret it. This activity requires a critical approach to digital content and professional responsibility for the knowledge presented. The third condition is to ensure students' active and independent participation. Work with digital material should involve cognitive actions such as posing questions, identifying relationships, comparing and justifying conclusions. Learning tasks need to make students' decisions and the reasons for them evident. Independence emerges in moving from receiving prepared information to selecting content and adapting it to a pedagogical task. Organising such activity connects students' subject knowledge with their thinking about teaching.

The professional orientation of an activity is expressed in the task content. When preparing digital material, students identify its intended audience, the knowledge it requires and the difficulty it is meant to address. The pupil's expected thinking, necessary explanation and assessment requirement are aligned. Explaining this relationship turns a technical product into a teaching design. A professional task requires students both to know the content and to justify how it should be taught. The fourth condition is to organise individual support in accordance with students' preparation and needs. Mathematical knowledge, methodological skills and experience of using digital tools may differ. The content of support is determined by the specific area of difficulty. Additional guidance should support independent decision-making rather than complete the task for the student. Reducing support as understanding develops creates conditions for greater independence in professional activity. Individual support is provided while maintaining a common mathematical objective and professional requirement. The substantive complexity of a task and the amount of support are considered separately. Students need to identify their difficulty, select appropriate guidance and understand the outcome of using it. The university teacher provides support suited to a particular stage of activity. This arrangement accommodates differences in preparation while preserving a common direction for all students' further development.

The fifth condition is to organise connections across subjects coherently. Knowledge acquired in mathematical subjects becomes the content of explanations and learning tasks in mathematics teaching methodology. Pedagogical preparation clarifies requirements for organising pupils'

activities, communication and support. Each subject deepens the relevant aspect of professional preparation according to its purpose. When digital tools are used within these connections, continuity between mathematical content and its pedagogical application is maintained. Coordination across subjects also involves establishing common requirements for mathematical accuracy and sound instructional reasoning. Knowledge from one activity should support the next task, while tasks should target a new professional requirement rather than repeat exactly the same work. Students connect theoretical knowledge with explaining it to pupils, managing activities and responding to answers. This continuity allows preparation for using digital technologies to be organised as part of teacher preparation rather than as a separate technical exercise.

The sixth condition is to provide meaningful assessment and feedback. Assessment encompasses students' mathematical accuracy, justification of tool selection and ability to organise learning activities. Criteria are clearly communicated in advance and applied in accordance with learning objectives. The appearance of digital material or speed of completion does not provide a full account of professional preparation. Considering the content of a teaching design alongside the explanation of a pedagogical decision clarifies the areas in which a student needs support. Feedback should reveal the relationship between an identified difficulty and the next learning action. The nature of a shortcoming and the direction for correcting it are communicated clearly. Comments on mathematical content, the clarity of a question or the suitability of support provide a basis for revising a teaching design. When students explain the reasons for a correction, assessment becomes connected with reflection. Feedback thus serves to improve professional decisions as well as communicate an overall evaluation. Methodological support is necessary to apply these conditions coherently in the educational process. The university teacher and teaching practice supervisor listen to students' choices, ask substantive questions and help clarify their mathematical and pedagogical grounds. During preparation, complexity increases gradually, and the requirement for independence builds on previous activity. Students are guided to understand the possibilities and limitations of their decisions. This cooperation ensures that methodological support extends beyond providing a ready-made solution.

Collaborative discussion and a constructive attitude towards errors are important conditions of a professional learning environment. Discussion focuses on students' mathematical reasoning and pedagogical decisions rather than their personalities. Feedback is based on a specific substantive criterion, and alternative choices are explained together with their grounds. Such communication makes it possible to examine shortcomings openly and improve teaching designs. Explaining one's own decision and understanding another perspective are connected with prospective teachers' preparation for professional communication. An accessible digital environment should meet both technical and content requirements. Access to materials, legible notation and functioning essential features are organisational conditions for learning activities. The arrangement of information should make it easier to identify key content and return to a necessary explanation. Device, internet and time constraints are considered in advance. Although available conditions influence digital tool selection, the mathematical objective and the coherence of the main cognitive activity need to be maintained.

Responsible use of a digital environment requires acknowledging authorship, observing conditions of use and handling information about participants carefully. Students check the reliability of content and select the information required for a professional task. Discussion of a pupil's answer focuses on the cause of the mathematical difficulty. These requirements constitute the ethical dimension of pedagogical conditions. Professional responsibility is expressed at every stage of digital activity together with mathematical accuracy and appropriate pedagogical interaction. The interdependence of pedagogical conditions requires them to be organised as a whole. A clear objective guides content selection, content guides activity, and activity guides support and assessment. The technical environment and methodological support enable these connections to operate. The absence of one condition may limit the use of other opportunities. Professional preparation should therefore consider not only the availability of a digital tool but also the way it is used for a purpose, students' activity and the content of feedback.

Conclusion: Using digital educational technologies to develop prospective mathematics teachers' professional competence requires alignment between objectives, content, activities and assessment. Mathematical accuracy, active participation, individual support, connections across subjects and methodological support are the main pedagogical conditions for preparation to use digital technologies. An accessible and responsibly organised environment helps put these conditions into practice. Their professional significance lies in enabling students to connect mathematical knowledge with explaining content, organising learning activities and justifying pedagogical choices.

References

1. Alixonov S. Matematika o'qitish metodikasi. - Toshkent: Cho'lpon nomidagi nashriyot-matbaa ijodiy uyi, 2011. - 304 b.
2. Yunusova D.I. Matematikani o'qitishning zamonaviy texnologiyalari. - Toshkent: O'qituvchi, 2010.
3. Barakayev M., Tojiyev M., Yunusova D., Mamadaliyev K. Matematika o'qitish texnologiyalari va loyihalash. - Toshkent: Innovatsiya-Ziyo, 2020. - 276 b.
4. Xoliqov A.A. Pedagogik mahorat. - Toshkent: Iqtisod-moliya, 2011. - 420 b.
5. Tolipov O'.Q., Usmonboyeva M. Pedagogik texnologiyalarning tatbiqiy asoslari. - Toshkent: Fan, 2006. - 261 b.