IMPROVING THE CRITERIA AND INDICATORS FOR ASSESSING 4C SKILLS IN PROSPECTIVE EDUCATORS

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Abstract. The article examines the improvement of assessment criteria and indicators of 4C skills in prospective preschool educators. The aim is to develop a theoretically grounded, clear and observation-based assessment system and to test it. The study was conducted in three stages: content analysis of international frameworks, expert qualitative review of the criteria content, and a pilot test of the rubric. As a result, a four-level descriptive rubric comprising 12 criteria and 36 indicators across the four skills was developed. Qualitative findings of the expert review and pilot testing are presented. The proposed system can be used in higher education institutions to assess the professional competences of students in preschool education.

Keywords: 4C skills, critical thinking, creativity, communication, collaboration, assessment criteria, indicator, rubric, prospective preschool educator, early childhood education.

BO'LAJAK PEDAGOGLARDA 4C KO'NIKMALARINI BAHOLASH MEZONLARI VA KO'RSATKICHLARINI TAKOMILLASHTIRISH

Annotatsiya. Maqolada bo'lajak maktabgacha ta'lim tarbiyachilarida 4C ko'nikmalarini baholash mezonlari va ko'rsatkichlarini takomillashtirish ko'rib chiqiladi. Maqsad – nazariy asoslangan, aniq va kuzatishga asoslangan baholash tizimini ishlab chiqish va uni sinovdan o'tkazish. Tadqiqot uch bosqichda o'tkazildi: xalqaro frameworklar mazmunini tahlil qilish, mezonlar mazmunini ekspert sifatida baholash va rubrikasini sinovdan o'tkazish. Natijada to'rtta ko'nikma bo'yicha 12 mezon va 36 ko'rsatkichdan iborat to'rt darajali tavsifiy rubrika ishlab chiqildi. Ekspert baholash va sinov natijalarining sifat xulosalari keltirilgan. Taklif etilayotgan tizim oliy ta'lim muassasalarida "Maktabgacha ta'lim" yo'nalishi talabalarining kasbiy kompetensiyalarini baholashda qo'llanilishi mumkin.

Kalit so'zlar: 4C ko'nikmalari, tanqidiy fikrlash, ijodkorlik, muloqot, hamkorlik, baholash mezonlari, ko'rsatkich, rubrika, bo'lajak maktabgacha tarbiyachi, erta bolalik ta'limi.

СОВЕРШЕНСТВОВАНИЕ КРИТЕРИЕВ И ПОКАЗАТЕЛЕЙ ОЦЕНКИ НАВЫКОВ 4С У БУДУЩИХ ПЕДАГОГОВ

Аннотация. В статье рассматривается совершенствование критериев и показателей оценки навыков 4С у будущих педагогов дошкольного образования. Цель исследования – разработать теоретически обоснованную, чёткую и основанную на наблюдении систему оценки и апробировать её. Исследование проводилось в три этапа: контент-анализ международных рамок, экспертная качественная оценка содержания критериев и пилотное тестирование рубрики. В результате разработана четырехуровневая описательная рубрика, включающая 12 критериев и 36 показателей по четырём навыкам. Представлены качественные результаты экспертной оценки и пилотного тестирования. Предложенная система может быть использована в высших учебных заведениях для оценки профессиональных компетенций студентов направления «Дошкольное образование».

Ключевые слова: Навыки 4С, критическое мышление, креативность, коммуникация, сотрудничество, критерии оценки, показатель, рубрика, будущий дошкольный педагог, дошкольное образование.

Introduction. Today's education system expects learners and students not merely to acquire knowledge but also to be able to apply it in new, unfamiliar situations [4]. In the international frameworks of different countries, critical thinking, creativity, communication and collaboration are recognized as core skills under the name "4C." J. Voogt and N. Roblin compared these frameworks and found that precisely these skills appear in almost all systems. P. Griffin, B. McGaw and E. Care emphasize that, alongside teaching 21st-century skills, assessing them reliably is equally important [6].

In Uzbekistan, the Concept for the Development of the Preschool Education System

until 2030 and the Law "On Preschool Education and Upbringing" place high demands on the quality of educator personnel. Since the educator is the key figure who forms 4C skills in the child, these skills must first be developed in the prospective educator himself or herself.

In practice, 4C skills are often assessed on the basis of general, imprecise descriptions. Such an approach leads to subjectivity, and the results of different assessors differ markedly from one another. The review by A. Jonsson and G. Svingby showed that rubrics with clear criteria and level descriptions increase the reliability of assessment [9]. E. Panadero and A. Jonsson, in turn, found that rubrics also support learners' self-regulation in the formative assessment process. At the same time, there are still not enough instruments that take into account the professional specificity of prospective educators and have clearly differentiated criteria and indicators.

In the Delphi study led by P. Facione on critical thinking, analysis, evaluation, inference, interpretation, explanation and self-regulation were identified as the core skills [5]. E. Lai, in her review, analyzed the difficulties of measuring these skills. In measuring creativity, the tests of E. Paul Torrance and the consensual assessment technique proposed by T. Amabile are widely used [1]. Collaboration and collaborative problem solving rest on Lev S. Vygotsky's sociocultural theory and on D. Johnson and R. Johnson's social interdependence theory [8]. F. Hesse and co-authors divided collaboration into social and cognitive components [7]. Ch. Kivunja interpreted the 4Cs pedagogically from the standpoint of the active construction of knowledge. In assessment theory, P. Black and D. Wiliam showed that formative assessment has a positive effect on learning outcomes [2], while S. Messick understood validity as a unitary construct.

In the context of preschool education, 4C skills are significant in two directions. First, in working with children, the educator correctly analyzes a pedagogical situation through critical thinking, enriches play and activities through creativity, establishes trusting relationships with children and parents through communication, and works together with the pedagogical team through collaboration. Second, the educator models these skills. Children learn more by observing the behavior of adults than by being taught. For this reason, the level of 4C skills of a prospective educator should be assessed as an integral indicator of professional preparation, and its growth should be tracked on the basis of clear criteria.

Although 4C skills have been widely analyzed for general and higher education, the development and empirical testing of criteria and indicators in the context of the professional activity of prospective educators remain insufficiently explored.

The following questions are used to determine how the criteria and indicators for assessing 4C skills in prospective educators can be improved, as well as their content validity and practical usability.

Research questions:

Which criteria and indicators of 4C skills, specific to the activity of a prospective educator, should be identified?

How do experts assess the content validity and clarity of the criteria of the developed rubric?

How close will assessors' judgments be when the rubric is applied in practice, and what disagreements arise?

Research methodology

A qualitative approach was used in the study. It included content analysis, expert discussion and descriptive analysis of observation results. Students of the "Preschool Education" program at a higher education institution took part in the pilot test. The expert group consisted of preschool education methodologists, candidates of pedagogical sciences and practicing educators. The study was conducted in three stages. In the first stage, content analysis compared the 4C components and descriptors on the basis of the P21, B. Trilling and Ch. Fadel, P. Griffin, J. Voogt and N. Roblin, and VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics, and these were then adapted to the professional context. In the second stage, expert evaluation was conducted using the Delphi method. Experts gave reasoned opinions on each indicator regarding its necessity, clarity, observability and suitability for preschool education practice. The opinions were summarized at each round, and the indicators were reformulated until general agreement was reached among the experts. The third stage was a pilot test, in which students' small projects, tasks analyzing problem situations, the design of group sessions and observations of educator practice were assessed. Each piece of work was assessed independently by assessors using the rubric. For each skill, an authentic task close to the professional context was selected. For critical thinking, a pedagogical case related to a child's behavior or the course of a session must be analyzed and the choice of solution justified in writing. For creativity, play and activity ideas suitable for children of different ages must be developed from the same material; for communication, a parents' meeting or a conversation with a child is simulated; and for collaboration, a weekly activity plan is designed jointly in a group of 3-4 people. The result of each task is analyzed not only against the relevant criteria of the rubric but, as far as possible, on the basis of several sources of observation.

Because A. Jonsson and G. Svingby note that training assessors significantly increases the reliability of a rubric, the assessors underwent an orientation before the study, jointly assessed sample works and discussed their disagreements.

The quality of the rubric was examined through content analysis of the experts' recommendations, the assessors' exchange of opinions and the observation records. Where the levels assigned by the assessors differed, they were discussed jointly, and an agreed level was set by clarifying the descriptors. The participants gave voluntary consent, and the data were processed anonymously.

Results. As a result of the content analysis, three criteria were identified for each "C," and three observable indicators for each criterion (Table 1).

Table 1. Criteria and indicators for assessing 4C skills in prospective educators

Each indicator was described at four levels. These levels were named beginning, developing, proficient, and advanced. The novelty lies in the fact that the levels are expressed not through evaluative words such as "good," "average"

or "poor," but through descriptions of observable behavior. This approach is consistent with the recommendations of S. M. Brookhart [3].

Each indicator is marked with one of the four levels. As an example, the level descriptions for one criterion from each skill are given in Table 2.

Table 2. Descriptors for the levels of the criteria

The overall level of a skill is determined on the basis of the general description of the levels manifested in the indicators. The skill is assessed at the level whose descriptor matches the majority of the indicators. If the assessors' opinions differ, they determine the final level through discussion. The quantitative thresholds in the descriptors may be adapted depending on the type and duration of the task. Assessment is not a one-time event: the rubric is applied at the beginning, in the middle and at the end of the semester, showing the dynamics of the student's development, which is consistent with the principle of formative assessment. A portfolio, a practicum observation sheet, a group project and a self-assessment questionnaire are used as sources of assessment. Relying on several sources increases the validity of the result.

According to the results of the expert discussion, the experts noted that the structure of the rubric is clear and understandable. During the discussion, some indicators were reformulated in the form of observable behavior, closely related wordings were clarified, and indicators specific to preschool education practice were retained.

The results of the pilot test showed that the level descriptions of the rubric enabled assessors to compare a student's performance on the task on the basis of concrete behaviors. In cases where the assessors' opinions differed, the descriptors were clarified and the descriptions were supplemented with sample works.

Discussion. The results of the study are consistent with the conclusion that moving from a "general description" to an "observable indicator" in the assessment of 4C skills may further improve the quality of assessment. The critical thinking criteria were in line with the core skills of Peter A. Facione, and the collaboration criteria with the social and cognitive components of F. Hesse. The inclusion of appropriateness and child safety in the creativity criteria, alongside E. Paul Torrance's dimensions, showed that, owing to the professional requirements of preschool education, an idea, regardless of how original it is, must be suitable for the child's age and development.

One important question concerned the overlap of 4C skills. For example, collaboration cannot take place without communication, nor critical thinking without reflection. Therefore, in the rubric each indicator was formulated so as to belong to only one criterion. It was noted that one activity may be assessed separately on several indicators. This approach is consistent with the principle proposed by P. Griffin of "breaking a skill down into observable components." On the other hand, as Charles Kivunja emphasizes, measuring the 4Cs separately may not sufficiently reflect their joint manifestation in context, which is why integrative tasks are important.

International frameworks are designed for general education and higher education students, whereas the proposed rubric consists of indicators related to the activity of a preschool educator. In this respect, it does not replace the existing frameworks but adapts them to the professional context. In assessment, the possibility of systematic errors such as self-assessment bias and the influence of the assessor's mood must be taken into account, and for this purpose several assessors and several sources should be used.

In line with S. Messick's recommendation, the results provide content-related evidence of validity, but other types of evidence need to be examined in future research. The limitations of the study included the restriction of the participants to a single region, the short duration of observation, and the context dependence of 4C skills. In the future, it will also be possible to apply the rubric at other higher education institutions and among practicing educators, and to carry out long-term research.

The practical significance of the study is that the rubric can be used in assessing subjects and pedagogical practice, in students' self-assessment, and in formative assessment and portfolio keeping.

Conclusion. In conclusion, it can be said that 4C skills should be assessed in prospective educators not only as personal but also as professional competence, because they are a prerequisite for forming these skills in children. The basis for improving the assessment of skills is rubrics consisting of clear criteria, observable indicators and descriptive levels. The developed system includes 4 skills, 12 criteria, 36 indicators and 4 levels. Its content validity was substantiated qualitatively through expert discussion and pilot observation. Finally, it is advisable to introduce the rubric step by step into practice, independent work and final assessment in higher education institutions, and to train assessors to work with the rubric.

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