FORMATIVE ASSESSMENT OF PROFESSIONAL COMPETENCIES OF FUTURE GEOGRAPHY TEACHERS

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The article deals with modern trends in the modernization of control and assessment of educational achievements of future geography teachers, which contribute to increasing the motivation of their educational and cognitive activities and improving self-organization skills. It is established that the competency-based approach to the organization of the educational process includes determining the level and quality of professional competencies. The problem of finding new approaches to the assessment of educational activities and educational results of students is analyzed. It is proven that one of the ways to solve the outlined problem was the
systematic implementation of formative assessment of educational achievements as a component of competency control technology. The concepts of “formative assessment”, “competency control”, “competency-oriented tasks” are explained and their place in the educational process is outlined. The model of the process of realization of formative assessment in higher education institutions, the algorithm for applying competency-oriented tasks, the structural components of the technology of competency control and formative assessment are presented. The work identifies and characterizes diagnostic, current-formative, self-assessment-formative, modular-formative, summative-normative and qualification types of assessment of students’ educational achievements. Based on the experience of implementing the technology of competency control and formative assessment, it was proven that it contributed to increasing the motivation and self-organization of students, allowed the teacher to diagnose and make positive changes to the educational process, and maintain feedback with students. Comparison of traditional assessment and the technology of competency control and formative assessment demonstrated its ability to comprehensively assess and determine the level of competency formation of future geography teachers. It was concluded that the introduction of this technology, on the one hand, enables teachers to ensure effective educational activities of students at a high level of motivation, self-organization and in accordance with their interests. On the other hand, it will contribute to the professional development of future geography teachers, who will teach students in the conditions of reforming national education.

Keywords: formative assessment; competency control; technology; motivation of students’ educational and cognitive activities, competency-oriented tasks; future teachers of geography.

1. INTRODUCTION

The problem statement. A modern teacher is characterized by continuous self-development at the personal and professional level. His/her tasks include the modernization of methods, methodological techniques and organizational forms that would interest students in the learning process. As V. Vember points out, in order to “satisfy to the fullest extent the educational needs of young people, to form their activity, creativity and motivation, it is necessary to update pedagogical approaches in teaching, and, most importantly, to learn not to pull students out of their comfort zone, but to keep up with the times, to introduce modern educational technologies that are close to students born in the information society” (Vember, 2019, p. 45).

The present day requires from higher education institutions (HEI) the training of highly qualified specialists in the field of pedagogical activity in general and the training of future geography teachers in particular. The search for ways to improve the efficiency of the use of teaching tools led to the realization of the need to improve the quality of control and assessment of educational and cognitive activities and educational achievements of future teachers.

It is well known that it is impossible to gain knowledge without systematic work and mental efforts. When yesterday’s school graduates begin their studies at pedagogical higher education institutions, their level of motivation, self-organization skills, and educational skills are significantly different. However, joining a new community, they try to make a good impression on their classmates and teachers. Students of the first year of study are psychologically
not ready to admit publicly that they did not understand the new educational material, cannot complete a practical task, etc. Instead, they claim that they have no questions to the teacher and they do not need individual explanations. This is the reason behind the learning lag, which increases over time, and the so-called “debts” in the performance of tasks accumulate. So it’s worth asking the question: “What exactly causes problems with the success level of first-year students?” After all, most of them are motivated at least by the desire to receive a scholarship.

Unfortunately, the loss of students’ interest is often the result of shortcomings in the organization of the educational process, in particular, the organization of control of their educational and cognitive activities. Usually, a lot of attention of teachers is directed to determining the level of formation of educational results, organization of intermediate and final examination. Instead, the problem of assessment is not considered urgent, its motivational possibilities are not used to the full extent, they are not directed to the self-development of students.

First of all, it is worth to define the general demand of modern society regarding the intellectual and moral development of the individual, which mostly takes place in higher education institutions. The Law of Ukraine On Higher Education states that higher education is “a set of systematized knowledge, abilities and practical skills, ways of thinking, professional, worldview and civic qualities, moral and ethical values, and other competencies acquired at a higher education institution, which are higher in complexity than the level of full general secondary education” (Law of Ukraine On Higher Education, 2014).

The goal of modern higher education is “comprehensive development of a person as an individual and the highest value of society, the development of his/her talents, mental and physical abilities, moral education” (Ilchenko, Sheyko, 2014, p. 9).

In accordance with the above, the formation of professional competency of future geography teachers is a multi-vector process. The controlling system, as a component of this process, should be of an individualized nature. Assessment of the educational and cognitive activity and educational achievements of the future teacher of geography should stimulate him/her to independent search for ways to professional and intellectual growth.

From the teacher’s point of view, assessment should be diagnostic in nature. “At the current stage of the development of the national higher education institutions and its integration into the European educational space, the problem of diagnosing the educational achievements of students is of particular relevance” (Lysenko, 2018, p. 55).

At the same time, one of the problems of higher education is the lack of theoretical, methodical and methodological substantiation of approaches to the assessment of students’ educational results as a tool for their motivation and encouragement. So, currently, an urgent problem of training future geography teachers is the development of a system of control and assessment of educational achievements, which would direct them to self-development and professional growth throughout their lives.

**Analysis of recent studies and publications.** Control and assessment of educational achievements of students in higher education institutions is in the center of attention of many scientists. However, their views on this subject of study differ significantly.

In the appropriate theoretical and methodological sources, an analysis of the methodological apparatus of student control and assessment is carried out; in particular in the text-
books and study guides of A. Aleksiuk (1998); S. Vitvytska (2011); V. Holovenkin (2019); A. Ilchenko (2014); L. Kalashnikova, O. Zhernovnikova (2016); A. Kuzminskyi (2012); V. Ortynskyi (2009); T. Turkot, O. Konoval (2016); M. Fitsula (2002) separate chapters are dedicated to this topic. The problem of assessment and its impact on the educational process was studied by domestic and foreign scientists in the works of A. Abaturov and A. Nikulina (2021); O. Nalyvaiko, K. Kutsyna (2021); I. Kholod, T. Lysenko, H. Shtanhret (2023) and others. Studies of E. Bazhmina (2021); V. Vember (2019); H. Voitkiv, M. Hladun (2019); I. Kalinina (2021); O. Lokshyna (2009); N. Morze (2019); O. Pometun (2019); Paul D. Nichols, Jason Meyers and Kelly Burling (2008) and others are devoted to the implementation of formative assessment of educational achievements.

Despite the rather wide list of studies devoted to the assessment of educational achievements of higher education students, the problem of finding new approaches to the assessment of educational activities and educational results of future geography teachers requires scientific and methodological investigations. This is what determined the choice of the topic of our research.

2. STUDY METHODS

In the process of our study, methods of analysis of psychological-pedagogical and methodological literature were used to clarify the state of development of the problem of implementation of formative assessment of professional competencies of future geography teachers. Pedagogical observation of the implementation of formative assessment in practical classes in the disciplines Geography Teaching Methodology, General Earth Science, Geography of Continents and Oceans and Physical Geography of Ukraine was carried out at Poltava V. Korolenko National Pedagogical University. It was aimed at determining the pedagogical conditions for the implementation of algorithms of the technology of competency control and formative assessment. Testing of students was aimed at determining the dynamics of their educational results and adjusting the proposed algorithms.

3. THE RESULTS AND DISCUSSION

The purpose of the study was to develop theoretical principles and methodological recommendations for formative assessment of educational achievements of future geography teachers.

First of all, we should decide on the main definitions that will be used in our study. Analysis of the concept of “control” is carried out by many scientists. T. Turkot and O. Konoval note that control “(from the French “control”) in the higher school didactics should be understood as pedagogical support, observation and verification of the success of students’ educational and cognitive activities” (Turkot, Konoval, 2013, p. 198). L. Kalashnikova and O. Zhernovnikova consider the definition of “control of the educational and cognitive activity of students” as “a component of the educational process of higher education, which contributes to the improvement of students’ work, the formation of their personality, the identification of real educational achievements, the disclosure of the reasons of their ineffectual understanding of the education content, etc. Control ensures the diagnosis of the results of the educational activities of students and the teacher in order to identify, analyze, assess and correct training” (Kalashnikova, Zhernovnikova, 2016, p. 149).
The need to control educational work and assess students’ knowledge has an objective nature. There is a regular link in the chain: learning goal – process – result – next goal. But in order to pedagogically competently define the goal, it is necessary to know exactly what has already been achieved as a result of learning (Strazhnikova, 2018, p. 94).

It is important to establish the components of control over the educational activities of students:
1) checking the level of knowledge, skills and abilities;
2) assessment – determining the level of mastering;

“Solving the problem of improving the quality of training of specialists with higher education at the current stage involves a significant improvement in the control of students’ academic work as an important means of managing the learning process” (Strazhnikova, 2018, p. 93–94).

Control is an important factor in the learning process of any educational subject, it makes it possible not only to establish the level of learning success level, but also to identify deficiencies in knowledge, abilities and skills and thereby determine the necessary changes that need to be made to the work methodology (Nemchenko, Holik, Lebid, 2014, p. 192–193).

We believe that the control of students’ educational achievements occupies an important place in the educational process because it should determine not only the course of their educational and cognitive activities, but first of all the level of formation of professional competences.

As for the assessment of the level of competency formation, it is worth to analyze the dynamics of conceptual approaches to understanding its conceptual and terminological content.

The well-known New Zealand scientist K. E. Beebe interprets assessment as “systematic collection and interpretation of facts, followed by the next stage – judgment about their value and appropriate planning of further actions.” (Gusen, Tijnman 2003, p. 18).

In our opinion, the definition of the concept “assessment” provided by the American Federation of Teachers, the National Council on Measurement in Education and National Education Association is quite meaningful from the point of view of our study: “the process of collecting information used to make pedagogical decisions about the progress of students in learning, for feedback, making decisions about the effectiveness of the educational process and the adequacy of the curriculum, the development of educational policy (Kellaghan, Greaney, 2001).

The above definition corresponds to the purpose and tasks of assessment of the educational achievements of students in higher education institutions. However, taking into account the conceptual changes in the theory and practice of assessment associated with the introduction of the principle of person-oriented learning, its formative function currently plays an important role.

As O. Lokshyna notes, “in Ukraine, there is no agreed view on the translation of the terminological combination “formative assessment” from the English language – such terms as “формативне”, “формуюче”, “формувальне”, “формаційне”, … etc are used” (Lokshyna, 2009).
I. Kalinina writes that “in the English language, there are two words for the term “оцінювання”: assessment and evaluation. In the Ukrainian language, one word corresponds to them – оцінювання. English assessment is interpreted as “формувальне”, “формуюче”, “формативне” assessment, etc. And evaluation is translated as “summative”, “final”. According to the author, “in countries that have been practicing the competency-based approach in education for more than two decades, assessment and evaluation are clearly separated” (Kalinina, 2021).

In domestic higher education, summative assessment is mainly used, and formative assessment is carried out in unsystematical and intuitive way. Instead, for training to be effective, assessment should be formative, i.e. it should identify learning needs, contribute to responding to them (Formative Assessment, 2005).

We believe that formative assessment in higher education institutions is an assessment in which the teacher is able to determine not only the quality of knowledge, but also to examine the individual achievements of students. Such an assessment helps to understand exactly where there are gaps in the students’ knowledge, abilities and skills, and actually encourages them to improve themselves and increase the efficiency of the educational process.

Since 2017, the educational reform of the Ministry of Education and Science “New Ukrainian School” (NUS) has been implemented in Ukraine, which provides for the introduction of mandatory formative assessment. From the point of view of NUS, such assessment is considered as “assessment during learning” and “for learning”. It is “formative” because, unlike the summative one, it aims to form (or format) the educational process taking into account the educational needs of everyone. (Pidhorna, Berehovska, 2021).

A. Predyk notes that “in contrast to the traditional assessment in the new conditions of the NUS, the method of formative assessment is being actively used by modern teachers as one of the key factors of quality education” (Predyk, 2022).

H. Voitkiv notes that the use of formative assessment is especially relevant and important for students of the specialty 014 Secondary Education, that is, future teachers who will teach pupils of the new Ukrainian school. The new Ukrainian school needs a review of student assessment approaches, improvement of the existing assessment methods, gradual introduction of formative assessment (Voitkiv, 2020 p. 45).

According to the current vector of development of school evaluation, HEIs should introduce formative assessment for two reasons. First of all, such assessment contributes to the individualization of the educational process. Secondly, participation in formative assessment as its object will allow future teachers to form the ability to carry it out in the future.

We believe that formative assessment in HEIs can be no less effective than in general secondary education institutions. This is explained by the fact that the age characteristics of students enable them to be responsible for individual learning, since their metacognitive skills are more developed. Currently, formative assessment is provided by drawing up individual planning of the student’s educational process and self-assessment of professional competencies (Fig. 1).
In modern didactics of geography, the following types of control and assessment are usually distinguished: previous (diagnostic), current, thematic (periodic), summative, self-assessment (Samoilenko, Topuzov, Vishnikina, 2014).

The transition to the implementation of formative assessment requires adjustments to such systematization. First of all, as noted by I. Kholod, two categories of assessment of student achievements can be distinguished – “assessment of learning” and “assessment as learning”. The first involves the assessment of actual results at different stages (current, thematic-periodic, summative) in accordance with regulatory requirements. The second is based on measuring the progress of each student, involves students in the process of assessment and self-assessment (Kholod, Lysenko, Shtanhret 2023).

Based on the analysis of scientific and methodological sources and our own studies, we identified the following types of assessment of educational achievements of future geography teachers: diagnostic, current-formative, self-assessment-formative, modular-formative (periodic), summative-normative and qualifying.

Diagnostic assessment is carried out at the beginning of studying the discipline; formative-current – in the process of its study; self-assessment-formative – permanent assessment by students of their own educational achievements with the aim of continuous self-improvement; formative-modular (periodic) – after studying the content module of the discipline; summative-normative – at the end of the semester; qualifying – upon completion of the educational program. The subject of assessment is the professional competencies of students as learning results specified in the educational program. In our case, the educational and professional program Secondary Education (Geography).

I. Kalinina points out that formative assessment is an effective means of organizing feedback. However, in order for assessment to become formative, it is necessary to use it constantly, to give students immediate feedback. There are many means for this, almost any form of control can implement formative assessment, the main thing is that its purpose would be the dialog between the teacher and the student and improvement of the educational process. And students’ knowledge and their motivation for learning and development will be the result of such work (Kalinina, 2021, p. 289).
We fully agree with the reasoning of N. Morze, V. Vember, and M. Hladun, that at the current stage of education transformation, formative assessment is one of the most effective types of assessment, which involves the improvement of both the student and the teacher. Unlike summative assessment, which only records the result of the student’s educational achievements, formative assessment provides the opportunity for the student to eliminate gaps due to feedback and teacher support and get a better result (Morze, Vember & Hladun, 2019, p. 212).

Such assessment, on the one hand, helps the teacher to understand exactly where there are gaps in the knowledge, skills and abilities of students and whether they are able to apply them. On the other hand, it encourages students to self-improvement and contributes to increasing the efficiency of the educational process.

Therefore, formative assessment increases the student’s motivation, thereby encouraging better learning performance. The implementation of such an assessment in higher education institutions will increase the level of professional achievements of teachers, which will ensure high-quality geographical education in Ukraine.

Currently, the inability of traditional control to meet the needs of higher education has led to changes in the educational system, in particular, the development of new control technologies that have certain advantages over traditional control. “In the situation of higher education reformation, deployment of innovative processes in education, there is a need to introduce innovative pedagogical technologies (methods) into the educational process of higher education institutions”. (Pryshchak, Zaliubivska, 2019, p. 132).

We believe that the technology of competency control and formative assessment (CCFA) is currently promising. According to the name, the technology involves the systematic application of formative assessment in combination with competency control (fig. 2).

Fig. 2. Structural components of the CCFA technology
The main feature of competency control is the determination of the level of formation of students’ competencies as educational achievements. According to the CCFA technology, the determination of this level is carried out in chronological sequence. Competency is considered as the ability to apply knowledge, abilities, skills from geographical and psychological-pedagogical disciplines in the process of performing relevant tasks.

The CCFA technology is based on the use of competency-oriented tasks (COT) in the process of control. Such tasks are distinguished by their structure and content. The main features of COT are applied direction; the presence of a plot close to real life; availability of additional information that can be provided in different forms (verbal, graphic, cartographic, statistical, etc.). A fixed number of points is determined according to the level of complexity of the COT, which provides an opportunity for students to self-assess their own work (Vishnikina, 2017).

Therefore, the COT ensure the ability of the future teacher of geography to apply educational achievements in geographical and psychological-pedagogical areas during professional activity. In the process of applying the COT, the role of the student changes from an object to a subject of educational and cognitive activity (Fig. 3).

![Fig. 3. Algorithm for applying competency-oriented tasks](image)

It should be noted that, usually, students perform control tasks that are similar in a construction form. For example: “Define the term…, Mark on the map…, Make a comparative analysis…” Such tasks do not arouse interest and do not give an opportunity to show your individuality. That is why we offer to use COT, during the implementation of which there is an awareness of the essence of knowledge and its application.

COT enable the student to understand how abstract knowledge can be used in practical situations in order to solve important tasks and problems (Vishnikina, Halushka, 2022).

Formative assessment of the level of development of students’ competencies is an important component of technology. It initiates the implementation of its other components: self-assessment by students of educational achievements; feedback between the teacher and students; timely determination by the teacher of the causes of deviations in the student’s educational and cognitive activity. The last component of the CCFA technology is the correction of the educational process by the teacher at all stages of its implementation.

Our comparison of traditional assessment of students’ educational achievements, formative assessment, and the CCFA technology, based on the experience of its application, allows us to draw conclusions about its advantages, which we set out in Table 1.

It is worth emphasizing that the use of the CCFA technology contributes to the activation of creativity and non-standard thinking, the development of intuition in solving vital situations and creative potential.
Comparison of the peculiarities of traditional and formative assessment and the CCFA technology

<table>
<thead>
<tr>
<th>Criteria for determining efficiency</th>
<th>Traditional assessment</th>
<th>Formative assessment</th>
<th>Technology of competency control and formative assessment</th>
</tr>
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<tbody>
<tr>
<td><strong>Didactic purpose</strong></td>
<td>Normative assessment of students’ knowledge, abilities and skills</td>
<td>Stimulating assessment of educational achievements</td>
<td>Comprehensive assessment and determination of the level of competency formation</td>
</tr>
<tr>
<td><strong>Objects of assessment</strong></td>
<td>Assessed by the teacher</td>
<td>Assessment by the teacher, self-assessment of the student</td>
<td>Assessment by the teacher, self-assessment and mutual assessment of the students</td>
</tr>
<tr>
<td><strong>Subject of assessment</strong></td>
<td>Knowledge, skills and abilities are assessed as a result of learning</td>
<td>Process and the result of learning are assessed</td>
<td>The level of competency formation is assessed (measured)</td>
</tr>
<tr>
<td><strong>Type of interaction</strong></td>
<td>Competition between students</td>
<td>Mutual assistance while learning</td>
<td>Cooperation, mutual learning</td>
</tr>
<tr>
<td><strong>Motivation nature</strong></td>
<td>Motivation decreases</td>
<td>Motivation increases</td>
<td>Self-motivation prevails</td>
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</table>

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

In the 21st century, the didactics of geography are searching for new objective methods of control and assessment of the professional competencies of students of higher education institutions. There is an urgent need for the development, testing and implementation of new conceptual approaches and technologies that will provide the ability to adjust the educational process by the teacher at all its stages. Implementation of competency control and formative assessment technology, on the one hand, enables teachers to ensure effective educational activities of students at a high level of motivation, self-organization and in accordance with their interests. On the other hand, it will contribute to the professional development of future geography teachers, who will teach pupils in a constantly changing educational environment.

We see the prospect of our next scientific and methodological studies in the development of methodological support for the application of the CCFA technology in the process of training of future geography teachers. The next task is an experimental study of the effectiveness of the application of its components according to certain criteria and appropriate methods. Provided the study results are positive, scientifically based recommendations will be developed for the implementation of the CCFA technology in higher education institutions.
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ФОРМУВАЛЬНЕ ОЦІНЮВАННЯ ПРОФЕСІЙНИХ КОМПЕТЕНТНОСТЕЙ МАЙБУТНІХ УЧИТЕЛІВ ГЕОГРАФІЙ

У статті розглянуто сучасні напрями модернізації контролю та оцінювання навчальних досягнень майбутніх учителів географії, які сприяють підвищенню мотивації їхньої навчально-пізнавальної діяльності і покращенню навичок самоорганізації. Встановлено, що компетентнісний підхід до організації навчального процесу включає визначення рівня
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і якості професійних компетентностей. Проаналізовано проблему пошуку нових підходів до оцінювання навчальної діяльності і навчальних результатів студентів. Доведено, що одним із шляхів вирішення окресленаї проблеми є системне впровадження формувального оцінювання навчальних досягнень як компоненту технології компетентнісного контролю. Розглянуто поняття «формувальне оцінювання», «компетентнісний контроль», «компетентнісно орієнтовані завдання» та окреслено їхне місце у навчальному процесі. Представлено модель процесу здійснення формувального оцінювання у закладах вищої освіти, алгоритм застосування компетентнісно орієнтованих завдань, структурні компоненти технології компетентнісного контролю і формувального оцінювання. У роботі виокремлено і схарактеризовано діагностувальний, поточно-формувальний, самооцінювально-формувальний, модульно-формувальний, підсумково-нормативний та кваліфікаційний види оцінювання навчальних досягнень студентів. На основі досвіду впровадження технології компетентнісного контролю і формувального оцінювання доведено, що вона сприяє підвищенню мотивації та самоорганізації студентів, дозволяє викладачеві діагностувати і вносити позитивні зміни у навчальний процес, підтримувати зворотній зв’язок зі студентами. Порівняння традиційного оцінювання та технології компетентнісного контролю і формувального оцінювання продемонструвало її спроможність щодо комплексного оцінювання і визначення рівня сформованості компетентностей майбутніх учителів географії. Зроблено висновок, що впровадження цієї технології, з одного боку, надає можливість викладачам забезпечити ефективну навчальну діяльність студентів на високому рівні вмотивованості, самоорганізації та відповідно до їхніх інтересів. З іншого, сприятиме професійному розвитку майбутніх вчителів географії, які навчатимуть учнів у умовах реформування вітчизняної освіти.

Ключові слова: формувальне оцінювання; компетентнісний контроль; технологія; мотивація навчально-пізнавальної діяльності студентів, компетентнісно орієнтовані завдання; майбутні вчителі географії.