



## **Building Future Specialists’ Reflective and Prognostic Competence in the Context of Blended Learning**

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### **ABSTRACT**

The aim of this study was to identify teaching methods that promote building students' reflective and prognostic competence and to determine their effectiveness in the context of blended learning. The Bezpalko's Scale was used to determine the level of reflective and prognostic competence. Final testing and questionnaire survey of students were also conducted. Besides, mathematical data processing methods, Pearson's chi-squared test, Cohen's kappa coefficient and Statistica software were used. The positive result of interactive methods such as case studies, projects, flipped classroom, interviews, discussions and debates in the development of reflective and prognostic competence was found, so they can be used in blended learning. It was established that the use of interactive methods has formed students' habit to analyse their own learning experience more often. They learned to draw appropriate conclusions and take measures to improve learning productivity. The blended learning and the emphasis on the development of reflective and prognostic competence contributed to the development of students' conciseness, clarity and accuracy in formulating opinions and answers to questions. It contributed to the development of the ability to predict possible ways to solve professional problems, anticipate and avoid risks, mistakes, creatively apply theoretical knowledge in performing practical assignments. The use of information and communication technologies and interactive methods in blended learning also contribute to the improvement in student learning outcomes by an average of 8%. Reflective and prognostic competence helps students to improve their performance during their studies and can be useful in future professional activities. However, purposeful work of all participants in the educational process is required for building and developing this competence. Future research should be aimed at finding effective ways and methods of building and developing reflective and prognostic competence in view of its importance in the professional activities of specialists in all fields.

**Keywords:** Case studies, distance learning, interactive methods, online learning, project method, reflective environment.

### **1. INTRODUCTION**

A rapidly evolving and changing world dictates that specialists must learn to make the right professional decisions, predict developments and results of their activities, even in the conditions that are new for them, to make timely adjustments. Al-Zoubi et al. (2019) states that this requires specialists to have good knowledge in their field and be able to creatively apply it in professional activities, timely supplement it in line with changes and innovations. One of them is reflective and prognostic competence, which allows planning professional activities and predicting its results and risks, avoiding mistakes, based on self-analysis of their own experience and self-assessment of their actions and other people's actions. The development of this competence is one of the urgent tasks for teachers, which is combined with the need to revise and change the forms of education caused by the necessity to optimize the educational process. The academic literature abounds in works on building students' professional competencies, as well as on the search for optimal forms of learning that provide

high results and are suitable for use in any, even extreme, conditions. But there are still a number of inconsistencies and contradictions. For example, there is no single classification of competencies that a specialist should have. There are also no common definitions of competencies. Besides, the issue of building the reflective and prognostic competence remains open. The aim of this study was to identify teaching methods that can be used in a blended learning to contribute to the development of reflective and prognostic competence without reducing learning outcomes. This aim involved the following objectives:

1. Identify the teaching methods which can be used for building reflexive-prognostic competence in the context of the combination of distance learning with the traditional one.
2. Determine how the use of these methods in blended learning affects the level of students' reflective and prognostic competence.
3. Establish the impact of the use of methods under research in a blended learning on the academic results of students, and show the impact of reflective and prognostic competence on students' learning outcomes.

## 2. LITERATURE REVIEW

Researchers have different views on the classification of competencies. Bordiug and Ridei (2018) divided them into groups: special, professional, academic, research, laboratory, practical. Some of them have the components. For example, prognostic competence also belongs to the class of research competences in addition to analytical and methodological ones. In general, professional competence has an impact on the quality of specialist's activities (Klassen et al., 2020). There is another classification of professional competencies. Sharvara (2020) also considers the reflective criterion of prognostic competence along with motivational, cognitive, operational, and personal-creative ones. Ms (2020) believes that reflexive competence, along with cognitive and stimulating ones, are components of the teachers' competence, their professionalism and pedagogical skills, self-improvement and creativity. Prezliata et al. (2018) noted that reflective competence includes prognostic, research and ontological components.

According to Prezliata et al. (2018), reflective competence generally means the ability to combine professional knowledge with one's own abilities, anticipate one's creative path, set goals for professional activities and make timely adjustments in accordance with changing conditions. Sharvara (2020a) states that in philosophy, prognostic activity means an activity that is based on predicting the future based on experience.

The creation of a reflective environment is a necessary condition for the development of reflective competence. It implies problems which require updating professional experience for their solution. The effectiveness of learning also increases in the course of building reflective competence. Ms (2020) consider the model of building reflective competence. It is based on consistent and continuous re-evaluation of professional experience, analysis of one's own thoughts and actions, the necessary adjustment of knowledge and ideas.

Redko and Polonska (2020) found that the students build their reflective competence in the course of their self-analysis, self-assessment, self-correction of the learning process and learning outcomes. Perez Garcias et al. (2020) maintains that in general, reflection is part of the process of monitoring learning at different stages. Prognostic competence is also important for all professions. Wu et al. (2021) provides an example of medicine, where it allows predicting risks in decision-making, thus saving lives, optimizing the process of providing medical services. Sharvara (2020b) states that prognostic competence, which was built during studies in an educational institution, allows a specialist to predict the process of performing professional tasks, avoiding risks. Reflection helps to enhance students' motivation and improve academic results. Halverson and Graham (2019) explains this by the fact that awareness of one's own learning experience motivates even more thorough acquisition of knowledge in order to achieve satisfaction with the results obtained. Rafiola et al. (2020) emphasizes that reflective and prognostic competence helps to predict actions, determine the scope of efforts that need to be made to achieve the goal and assess problems and risks. Vykhreshch (2018) considers that it should be formed since an early school age. At the same time, interactive methods of learning and encouraging students to self-knowledge, self-management in learning (Vykhreshch, 2018) and research of professional problems (Prezliata et al., 2018) can be used. Prezliata et al. (2018) considers on-the-job training provided by the curricula of institutions of special and higher education also effective that allow students to immerse themselves in a professional environment, analyse the adequacy of their professional knowledge, predict the results of their own professional activities, see prospects. The prognostic component of reflective competence provides that specialists have such skills as creative solution of professional tasks based on theoretical knowledge, as well as practical skills, predicting the reaction of subjects of the production process, adjusting their own actions according to the situation. The prognostic competence built in the student days should be developed throughout the professional life of the specialist (Kondratiuk, 2020).

According to Suartama et al. (2019), the development of ICT entailed changes in pedagogy. For example, it has caused the emergence of new forms of learning: distance, blended, synchronous, asynchronous, and so on. Blended learning has emerged in pedagogy to optimize the learning process and replace traditional full-time learning with online synchronous or asynchronous one. Tidmore (2018) states that blended learning is the result of rethinking and restructuring the educational process.

Blended learning has a positive impact on its outcomes in both public and private educational institutions at all levels, from secondary school (Rafiola et al., 2020) to post-graduate school (Westerlaken et al., 2019). Islam et al. (2018) believes that it helps to enhance students' motivation to study. Increased availability and flexibility of learning, as well as its economic efficiency are also among one of the reasons to use blended learning. Blended learning should reduce the time students spend in classrooms (Dziuban et al., 2018), help find the best way to study for each subject (Albiladi & Alshareef, 2019).

Gagnon et al. (2020) provides synonyms for blended learning: hybrid learning, online learning, ipped, etc. There is currently no single interpretation of the concept of blended learning despite abundance of works (Cronje, 2020; Hrastinski, 2019) in the literature on its interpretation. For example, Gagnon et al. (2020) defines it as a combination of full-time and distance learning. The proportions of both forms in the academic literature are different. For Porter et al. (2014), blended learning means equal proportion of distance learning to full-time studies, that is 50x50%. Along with the first option, Diep et al. (2017) also considers the option of 25% online, 75% — in person. Müller and Mildenerger (2021) considers blended learning as a learning where the online form takes from 30 to 79% of the total learning time.

According to Hrastinski (2019), sometimes blended learning is a combination of different methods, not different forms of learning. Blended learning was popular long before 2019 (Jowsey et al., 2020), during the Covid-19 pandemic online learning became the only one possible form, after the Covid-19 pandemic blended learning grew even more popular (Gagnon et al., 2020).

Blended learning has proven to be more effective than face-to-face learning. Westerlaken et al. (2019) believes that it is also more effective than online learning. Gagnon et al. (2020) considers blended learning effective because of the successful combination of full-time and distance learning.

Different didactic methods are used in a blended learning, which can help in building different competencies. Luzik et al. (2019) point to the importance of interactive teaching methods and information technology in building of reflective and prognostic competencies as components of a research competence. Turk et al. (2019) indicates that case-based learning helps to improve learning outcomes. Besides, the completion of particular assignments encourages students to review their own experience and realize the lack of knowledge available to solve a particular situation. This means acquiring new knowledge by enhancing the motivation of students, consolidating previously acquired knowledge. Consideration of particular situations promotes the development of critical thinking. The evaluation of themselves and their peers when completing assignments promotes the development of reflective competence. But this teaching method has its drawbacks. For example, teachers spend a lot of time creating educational content. Turk et al. (2019) found that to keep a student active for one hour, the teacher must spend an average of 12 hours of time in the traditional form of education, and even more in the distance learning. Dziuban et al. (2018) states that there are open educational resources, the use of which does not reduce the effectiveness of student learning and saves teacher time for preparation. They are designed to teach students online according to the scenario determined for the teacher, and the provided forms of control of acquired knowledge and registration of student learning experience.

Bouilheres et al. (2020) notes that social networks and video conferencing can also be used to implement blended learning. The use of social networks in the learning process can help not only to engage students, but also to build their reflective competence. For example, the short format of messages on Twitter helps students to better understand the content of the text. And writing tweets can be considered a reflective practice. Teaching methods can be: problem-based, gamification, role-playing games, interactive quizzes, simulations (Bouilheres et al., 2020), group and project work (Jowsey et al., 2020), flipped classroom (Westerlaken et al., 2019), etc.

The online form of learning has certain shortcomings. Albiladi and Alshareef (2019) provides an example when the effectiveness of learning depends on the technical support available to students. Besides, Bouilheres et al. (2020) notes that it cannot replace the physical presence in the classroom and the corresponding interaction between participants in the educational process. Therefore, combining it with a traditional form of learning can eliminate these shortcomings.

Hrastinski (2019) states that multimedia and virtual technologies, video and web conferencing, etc. are used to support blended learning. Suartama et al. (2019) cites an example of the Moodle (Modular Object-Oriented Dynamic Learning Environment) learning platform that has become widely used. They allow learning synchronously and asynchronously. They also promote the interaction and cooperation of students with the teacher and with each other.

### 3. METHODS

This study was conducted in three stages.

The first stage involved the initial assessment of the level of reflective and prognostic competence in the students included in the sample. The V. Bezpalko's Scale was used for this purpose (Prezliata et al., 2018).

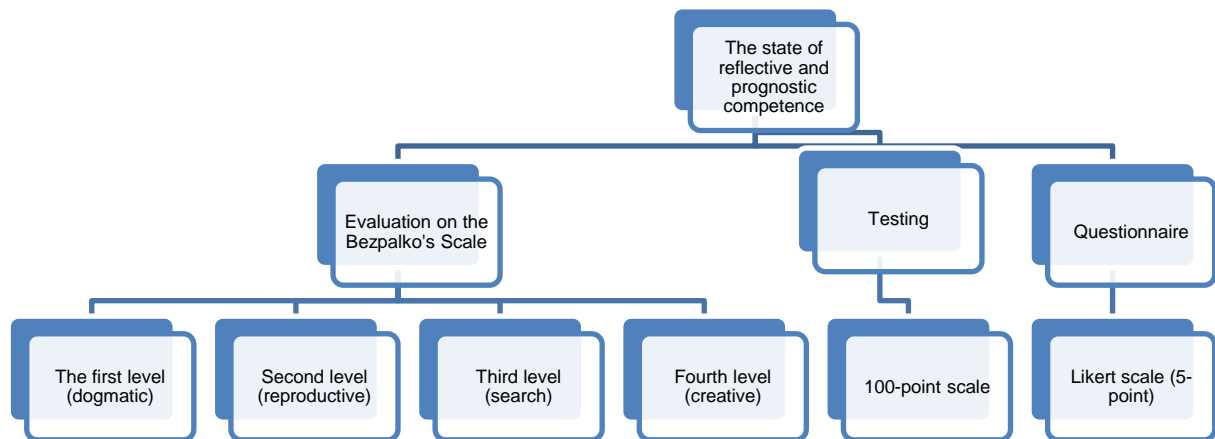
The second stage involved a pedagogical experiment, which consisted in the introduction of teaching and learning methods in the Experimental Group, which helps to build reflective and prognostic competence in students. The Experimental Group studied through blended learning, which provided from 50 to 70% of

academic time online. Fluctuations of 20% are determined by the specifics of the subjects taught. Control Group 1 studied through traditional system (face-to-face), where the attention of participants in the learning process was not on building reflective and prognostic competence. Control Group 2 studied through a mixed form. The ratio of face-to-face and online time was the same as in the Experimental Group. However, there was no focus on building the competence under research. Control Group 3 studied face-to-face with a purposeful building of reflective and prognostic competence. The same teaching methods were used as in the Experimental Group, but face-to-face.

The third stage involved the re-evaluation of the level of reflective and prognostic competence of students included in the sample on the V. Bezpalko's Scale. We also compared the results of students who were included in the experimental group and the three control groups. Final testing was also conducted to determine the level of acquired knowledge of students in all four groups. Besides, students were interviewed through a questionnaire (Bouilheres et al., 2020; Perez Garcias et al., 2020), adapted by the research team. The questionnaire met all ethical standards. Sufficient time was allotted to answer the questions of the questionnaire. The survey was free and anonymous.

The sample consisted of 20 teachers. One of the criteria for their selection was their teaching of subjects in groups of students included in the sample. There were 5 teachers who knew the method of building reflective and prognostic competence studied in this work, and also could implement it in blended learning. They worked with students of the Experimental Group. Another 5 teachers worked in Control Group 1 traditionally — face-to-face, while not focusing on building students' reflective and prognostic competence. The other 5 teachers had a positive experience of teaching in a blended form, while not focusing on building reflective and prognostic competence. They worked with students of Control Group 2. Control Group 3 was taught by 5 teachers who supported traditional forms of learning, but they contributed their time and efforts to build reflective and prognostic competence. Besides, the sample included 206 students: 53 —the Experimental Group, 52 — Control Group 1, 50 — Control Group 2, 51 — Control Group 3.

The research involved the method of determining the level of reflective and prognostic competence on the Bezpalko's Scale, final testing and questionnaire survey of students, mathematical methods of data processing and Statistica software.



**Fig.1: Research methods**

The dogmatic level (Figure 1) is characterized by intuitive use of the existing knowledge, skills and abilities by students, which does not allow predicting the results, assess risks and often — avoid mistakes. The reproductive level is characterized by a more conscious and independent application of knowledge according to known patterns and models. Students make mistakes in unusual situations, for which they don't have solution scenarios, and they don't know ways to correct them. Students who have an exploratory level of reflective and prognostic competence, can be independent in predicting the results of the use of independently selected tools, methods and techniques for solving professional problems. At the same time, they are guided by the acquired knowledge, skills and abilities, carry out self-assessment of their actions. The creative level of reflective and prognostic

competence is characterized by students' attempts to be guided in the completion of didactic assignments by actually created models. The students can justify their decisions, predict the results of their activities and avoid risks and mistakes.

#### 4. RESULTS

In the Experimental Group, it is proposed to focus on building reflective and prognostic competence along with other professional competencies. The teacher encourages students to analyse their learning activities, identify and discuss problems in learning, find ways to solve them with minimal risk and predict learning outcomes both during face-to-face and online classes, synchronous or asynchronous.

Interactive teaching methods that can be implemented in blended learning were used in the Experimental Group for the development of reflective and prognostic competence. These include: case studies, project method, problem-based learning, flipped classroom, interview, discussion, debates (Table 1). These methods require students to spend a lot of time on preparatory work that they can do at home. This allows reducing the time that students spent attending the educational institution, while not reducing the productivity of learning.

**Table 1: Teaching methods that contribute to building reflective and prognostic competence in blended learning**

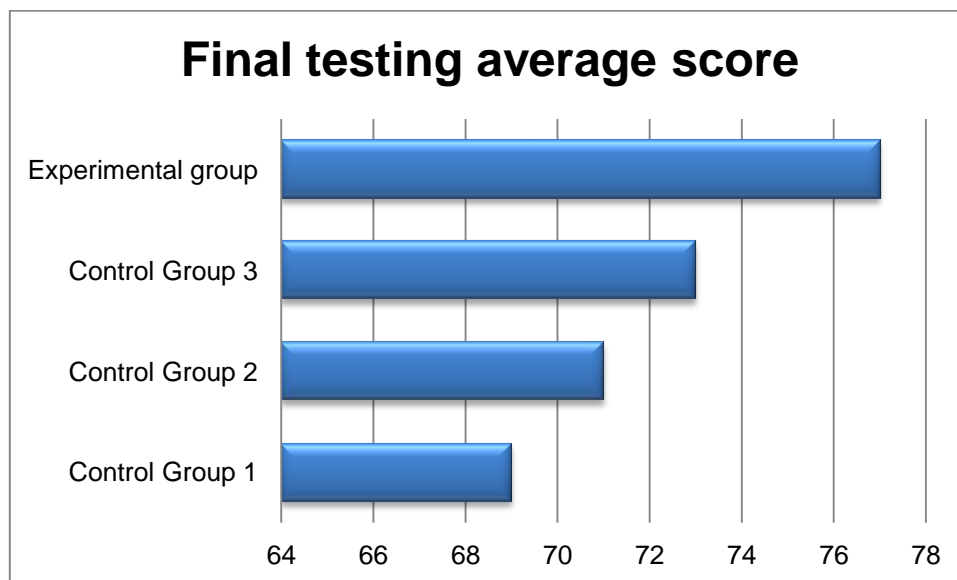
Learning method	Reflective component of competence	Prognostic component of competence	Online learning	Full-time studies
Case studies	Analysis of their own learning experience, identification of gaps in knowledge and coverage of those gaps for resolving a particular situation	Anticipating the results of the implementation of the proposed solution to the problem situation	A solution to a problem situation in small groups can be found remotely	Discussion of the proposed ways to resolve the real situation in the group
Project-based learning	Self-analysis of learning activities and experience for the acquisition of new knowledge, the implementation of active cognitive activities, evaluation of their work and the work of their classmates	Forecasting, designing, planning, their work to gain new knowledge	Preparatory work on the project	Presentation of the results of the project
Flipped classroom	Rethinking learning experience, self-analysis and self-assessment of their knowledge while processing new information based on materials provided by the teacher	Forecasting and planning the practical use of self-acquired knowledge during practical work and laboratory research	Learning theoretical material	Discussion of theoretical material that caused difficulties, performance of practical work and making a laboratory research
Interview	Self-analysis of their knowledge and its use in formulating questions (answers), analysis and evaluation of other students' knowledge	When formulating a question, predict the answer to be given by the interlocutor, his or her reaction to the question	Learning theoretical material, interviews can be conducted using an online educational platform	Conducting interviews
Discussion, debates	Self-analysis, self-evaluation and evaluation of other students	Anticipating all possible problems that may arise during the discussion and all ways to solve them	Learning theoretical material, a discussion may be held using an online educational platform	Holding a discussion

The research found (Table 2) that traditional methods and forms of learning do not contribute enough to the development of reflective and prognostic competence. At the beginning of the study, a dogmatic level of this competence was found in the majority of students (52%), as well as reproductive one (40%). From 6 to 8% of students had an exploratory level, and up to 2% had a creative level. If teachers do not make efforts and do not focus the attention of participants in the learning process on the need to develop the competence under research, its level will remain unchanged (Control Group 1 and Control Group 2 at the beginning and end of the study). If the case studies, project-based learning, flipped classroom, interviews, discussions and debates are used and attention is focused on the development of students' reflective and prognostic competence, its level can be increased in both traditional and blended learning. For example, the number of students who had a dogmatic level decreased almost twice in Control Group 3 (up to 28%), and twice in the Experimental Group (26%). The number of students with exploratory and creative levels of research competence also increased. There was an increase of 6% of both levels in Control Group 3, while in the Experimental Group — of 10% and 6%, respectively.

**Table 2: The results of assessing the level of students' reflective and prognostic competence**

The level of reflective and prognostic competence	Percentage of students							
	Control Group 1		Control Group 2		Control Group 3		Experimental Group	
	Before	After	Before	After	Before	After	Before	After
Dogmatic	52%	50%	52%	52%	52%	28%	52%	26%
Reproductive	40%	42%	40%	40%	40%	52%	40%	50%
Exploratory	6%	6%	8%	8%	8%	14%	6%	16%
Creative	2%	2%	0%	0%	0%	6%	2%	8%

Figure 2 presents the results of the final testing conducted in the three Control Groups and Experimental Group. As Figure 2 shows, according to the scores obtained for the final test, the experimental group students achieved the highest learning outcomes. The average score of students who used case studies, project-based learning, flipped classroom, interviews and discussions and debates in a blended learning is 77 out of 100 possible, which is 8 points higher than in students who studied according to the traditional model. The result of students in Control Group 3 (full-time, with the involvement of the methods under research) is 4 points lower. This evidences that the rational use of students' time, which is provided by the possibility of partial transfer of the educational process outside the educational institution, can have a positive impact on learning outcomes.



**Fig.2:Final testing results**

Table 3 presents the results of the survey conducted among the students included in the sample. They confirmed that the development of reflective and prognostic competence requires purposeful work. It can be built both in the full-time form of education and by combining the latter with distance learning. In case of blended learning, the productivity of the building the studied competence is higher. For example, the experimental group students more often analyse their own learning experience and the experience of classmates, draw certain conclusions, take measures to increase learning productivity. They are more likely than students of control groups to provide

themselves with the necessary learning materials. The blended learning and the emphasis on the development of reflective and prognostic competence contributed to the development of students' conciseness, clarity and accuracy in formulating opinions and answers to questions. It helped to develop the ability to predict possible scenarios, anticipate and avoid risks, mistakes, to use theoretical knowledge in practical work and laboratory research creatively.

**Table 3: The results of survey of students**

Item No.	Question	Average score on a Likert scale							
		Control Group 1		Control Group 2		Control Group 3		Experimental Group	
		Before	After	Before	After	Before	After	Before	After
1.	Does the reflection process help to understand information and key concepts?	2.2	2.2	2.2	2.3	2.2	2.9	2.2	3.1
2.	Do you think about what was the most important, the most interesting during your studies?	2.7	2.7	2.6	2.7	2.7	3.1	2.7	3.3
3.	Do you write down the most interesting moments from your educational activities?	2.1	2.2	2.1	2.3	2.1	2.6	2.1	2.9
4.	Do you think about what has already been studied?	2.3	2.4	2.3	2.3	2.3	3.0	2.3	3.3
5.	Do you sum up after studying a topic or section?	2.9	3.0	2.8	3.0	2.9	4.0	2.9	4.1
6.	Can you choose the words to summarize the material studied?	2.5	2.5	2.5	2.6	2.5	4.0	2.5	3.9
7.	Can you select the necessary materials to solve the problem independently, based on your own experience of educational activities?	2.1	2.2	2.1	2.2	2.1	3.8	2.1	3.9
8.	Can you answer questions during an online meeting or face-to-face succinctly, clearly and accurately?	3.1	3.2	3.0	3.1	3.1	3.9	3.0	4.1
9.	Does self-analysis and self-assessment help to deepen the knowledge of the subject?	2.7	2.7	2.7	2.7	2.7	3.5	2.7	3.6
10.	Do you feel that you have learned a lot?	3.2	3.3	3.2	3.2	3.2	3.9	3.2	4.0
11.	Do you compare your own views with those of your classmates?	2.5	2.6	2.4	2.4	2.5	3.8	2.5	3.9
12.	Are you interested in whether your classmates understood the educational material in the same way as you?	2.8	2.9	2.9	2.9	2.8	4.0	2.9	3.7
13.	Do you study new material using only your classmates' interpretation of it?	2.3	2.4	2.3	2.3	2.3	1.7	2.3	1.3
14.	Are you interested in other points of view regarding the material being studied?	2.1	2.2	2.1	2.1	2.2	3.8	2.2	3.8
15.	Can you control the reflective process yourself?	1.3	1.4	1.4	1.4	1.3	3.2	1.4	3.4
16.	Do you improve your reflection with the help of a teacher and classmates?	1.7	1.7	1.7	1.7	1.7	3.1	1.7	3.2
17.	Do you have enough knowledge to feel confident while studying in class?	2.9	3.1	3.0	2.8	2.9	3.6	3.0	4.1
18.	Do you use Internet resources to	2.5	2.7	2.4	2.6	2.5	2.8	2.6	4.5



	better understand the content of the material being studied?								
19.	Were you able to better understand the material considered in the classroom thanks to the previous work on the topic online?	1.2	1.2	1.1	1.1	1.2	1.5	1.3	3.9
20.	Do you plan questions that you would like to be answered in the classroom before class?	1.2	1.2	1.2	1.3	1.2	3.4	1.2	3.6
21.	Can you predict the results of your learning activities?	2.5	2.5	2.4	2.5	2.4	3.2	2.5	3.7
22.	Can you successfully use theoretical knowledge gained independently in the course of practical work or laboratory research?	2.6	2.7	2.6	2.3	2.6	3.8	2.6	4.0

The intergroup variance  $d$ , which is the weighted sum of squared deviations of the group means from the general mean, is determined by the heterogeneity of the sample, namely conducting the survey in different educational institutions included in the sample, ranged from 215 to 946. In turn, the intergroup variance, which describes the fluctuations of these groups, and intragroup variance, which describes the fluctuations due to random factors not taken into account, were not equal, which indicates the invalidity of the null hypothesis. Using Pearson's chi-squared test, we obtained  $\chi_1^2 > \chi_2^2$ .

In the studies conducted in the Experimental Group, Cohen's  $d$  was 1.0, which indicates a high magnitude of the effect of using case studies, project-based learning, flipped classroom, interviews, discussions and debates for building reflective and prognostic competence in blended learning. In Control Groups 1 and 2, the Cohen coefficient ranged from 0.5 to 0.6, which corresponds to the medium effect. At the same time, in Control Group 3 Cohen's  $d$  approached 1, which indicates the high efficiency of the proposed teaching methods for building reflective and prognostic competence not only in blended learning, but also in full-time studies.

## 5. DISCUSSION

The research conducted in this article showed that the development of reflective and prognostic competence in students in the course of their studies has a positive effect on their learning outcomes. Blended learning does not worsen learning outcomes, but improves them instead. Besides, the use of blended learning contributes to the better development of students' reflective and prognostic competence. It was also found that it is advisable to use such teaching methods as case studies, flipped classroom, project-based learning, interviews, discussions and debates. They can be implemented in blended learning and they contribute to building the competence under research.

Gagnon et al. (2020) found through a survey of medical students that blended learning is no less effective than traditional one, and also satisfies students' educational interests. Assignments prepared for the text of a lecture or video contribute to building of students' reflective competence.

Upon analysing 56 academic studies involving about 10,000 people, Vallée et al. (2020) concluded that students gain a much higher level of knowledge in blended learning compared to traditional full-time studies. In this case, blended learning meant a combination of traditional with digital, online, virtual, computer learning.

The survey conducted by Bouilheres et al. (2020) showed that students who have some experience in online learning find it convenient, flexible and effective compared to traditional studies. Müller and Mildemberger (2021) concluded that it motivates students and promotes their involvement, as well as awareness of their learning experience, and encourages them to take responsibility for their learning outcomes. It contributes to the individualization of the educational process and the development of competencies necessary for lifelong learning.

According to Müller and Mildemberger (2021), students prefer a blended learning where the share of online classes is medium or high, compared to traditional ones. In blended learning, the use of hypermedia resources, project-based learning, flipped classroom, quizzes, wikis, online glossaries, etc. is effective in learning management in more than 70% of students, and provides high learning outcomes in more than 40% students. More than half of the students have medium results, which is better than in the case of the traditional studies (Sáiz-Manzanares et al., 2020).

Westerlaken et al. (2019) emphasized that the use of interactive methods, in particular flipped classroom, in blended learning helps to improve students' perception of their learning outcomes. The average score on a 10-point scale was 7.6. Ulfa and Puspaningtyas (2020) notes that learning outcomes in the class where blended learning was used were on average 78.48 higher than in the control class where traditional learning was used, the standard deviation was 9.96.

Prezliata et al. (2018) found in a study of the level of reflective competence of students of pedagogical institutions that it is dogmatic and reproductive. This means that the vast majority of students use their knowledge either intuitively or consciously, guided by previously studied patterns and models, which often leads to errors. Sharavara (2020) determined the level of students' prognostic competence and found its low and medium levels. In particular, 50.7% of respondents had a low level the reflective component of prognostic competence, 43.4% had a medium level, and only 5.9% —a high level.

According to Ulfa and Puspaningtyas (2020), the use of information technology has proved to be effective in achieving high learning outcomes, and information networks can become a major tool for interaction between participants in the educational process in the future. And, as this research found, the focus of participants in the educational process on building reflective and prognostic competence in the context of blended learning promotes increased learning outcomes by an average of 8%.

## 6. CONCLUSIONS

The rapid development of technology, the associated increasing information volumes and rapid outdated of information challenge teachers to find the best forms and methods of teaching and learning. They must meet the students' educational needs, develop their competencies necessary for future professional activities, as well as the skills and abilities necessary for lifelong learning. The reflective and prognostic competence encourages self-analysis and rethinking of students' learning experience, identifying gaps in knowledge, taking measures to improve results, predicting them, anticipating and avoiding mistakes and risks. It was found that the case studies, project-based learning, flipped classroom, interviews, discussions and debates can be used in a blended learning environment. As in the traditional studies, they contribute to building reflective and prognostic competence, as well as to improving its level from dogmatic to reproductive, from exploratory to creative. Besides, these methods can improve student learning outcomes. The developed abilities of self-analysis, self-assessment and self-control also promotes success. The results of this work can be used by teachers and researchers in finding ways of building and studying the state of reflective and prognostic competence. It is appropriate to carry out research of other forms and methods of teaching which were not mentioned in this article in order to identify their impact on building and development of reflective and prognostic competence.

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