








## Development of future elementary school teachers' professional self-education readiness through interactive teaching methods

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### Abstract

A modern specialist's ability to self-educate is a valuable professional quality. Education has been given the essential responsibility to develop the learners' readiness for self-education (RSE). However, university students experience difficulties organizing and implementing self-educational activities. The study's goal is to investigate the development of students' RSE and the impact of interactive training methods (ITMs) on ensuring the development of self-education skills in future elementary school (FES) teachers. The study used a pre- and post-test design for FES teachers' readiness for self-education (RSE). The study involved 240 learners at E. Buketov Karaganda University, Karaganda, Kazakhstan. The study found that university students experienced difficulties in organizing and implementing self-educational activities. The findings revealed that using integrative teaching methods increased students' readiness for self-education which is a significant improvement over traditional methods. This paper contributes to the methodological potential of university education by providing an innovative approach to improve university students' self-education preparation.

**Keywords:** Development, Educational process, Future elementary school teachers, Interactive training methods, Readiness, Self-education.

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### Contribution of this paper to the literature

This study analyzes whether the interactive training methods (ITMs) of using innovative methods of teaching that were not covered in previous studies contribute to increasing the development of self-education skills in future elementary school teachers (FES) which is a prerequisite for their successful professional self-realization.

## 1. Introduction

The ability to self-educate is an important professional quality of a modern specialist. Modern society needs people striving for self-development due to which education has been entrusted with the task of developing the subjective position and subjective qualities of students in various types of activities. Independence, self-determination and self-development have become the most vital principles in today's society. The ability to create goals for self-change and develop strategies to achieve them is valued. Self-development refers to one's extension. The notion of personality and self-development is a result of current and potential future socio-cultural environments. Self-education for students, in addition to formal academic instruction can have a significant effect because of the objectives assigned to higher education. First of all, this process is carried out under competent pedagogical guidance. Secondly, the implementation of such leadership must be carried out through developed courses in the pedagogical cycle. Many students understand the meaning and purpose of self-study but lack the necessary skills and experience (Robinson & Persky, 2020).

The topic of self-education has received extensive and multifaceted coverage (Bond, Buntins, Bedenlier, Zawacki-Richter, & Kerres, 2020; Grassini, 2023). The specifics of self-education as a source of lifelong education and its main functions are defined in the works of Loeng (2020) and Morris (2019). Van Tonder, Kloppers, and Grosser's (2022) research seeks to support the principles of fostering students' preparedness for self-learning, the process of cultivating strategies for using personal information sources and the process of organizing high school students' cognitive activities. The interest was shown in the problems of self-education of students by Alegado, Navarro, Roxas, and Monteza (2023); Van Woezik, Koksma, Reuzel, Jaarsma, and van der Wilt (2021); Du Toit-Brits (2019) and Rusticus, Pashootan, and Mah (2023). Research demonstrates that students' needs for self-actualization, autonomy in social and career contexts and self-affirmation throughout life are characteristics of their time in higher education (Meo & Tarabini, 2020). As a result, this influences how students organise themselves and apply cognitive skills which affect how they perceive self-education as a means of personal growth. However, the topic of "self-education of a future primary school teacher" has not received enough methodological and scientific support in our country or enough conceptual comprehension. In fact, the delayed development of pedagogical university graduates as primary school teachers with an undefined, self-educational role as specialists seriously affects their professional development. Enhancing university teaching forms and techniques is necessary to solve this problem.

National initiatives to modernize teacher education in line with international trends are currently underway. However, it was discovered that more than half of them (55.9%) admit that their opinion is not taken into account when forming educational policy at the national level based on an analysis of a survey of Kazakh teachers. In turn, the new educational goals aim to maximize the disclosure and development of the student's abilities, motives and values. This is possible if the learner has a teacher nearby who has acquired a need for self-knowledge and self-development is constantly prepared for self-education and can engage in methodical self-improvement activities. Consequently, the educational experience at the university should offer a fresh perspective, creating numerous opportunities for personal and professional development. However, it is not enough to address the teacher's intrinsic need for self-development and creative self-realization in the existing practice of professional and pedagogical training which focuses only on the teacher as a performer with specific professional responsibilities. Furthermore, According to survey participants, opportunities for professional growth are helpful in sustaining a career in teaching. However, the majority of respondents believe their institutions do not foster a professional educational setting or offer new teachers sufficient support. Therefore, methodological work at the university must be focused on improving professional knowledge and actions. Self-development will enable the teacher to quickly retrain and rebuild his teaching activities in light of the increasing professional competence requirements. Thus, there is a need to create conditions in educational institutions that will ensure a teacher's professional development and satisfy the need for self-realization and self-development.

The study's goal is to investigate the development of students' RSE and the impact of interactive training methods (ITMs) on ensuring the development of self-education skills in future elementary school (FES) teachers.

RQ. What is the effectiveness of the use of ITMs in fostering the RSE of FES teachers?

The research hypothesis is that using ITMs in a university's educational process will significantly increase future elementary school teachers' (FES) readiness for self-education (RGE).

### 1.1. Research Contribution

This study's main contribution is an in-depth evaluation of how students at Kazakhstani pedagogical universities are developing their readiness for self-education. The study found that university students experienced difficulties in organizing and implementing self-educational activities (Barrot, Llenares, & Del Rosario, 2021). The findings also revealed that the independent efforts of students aimed at overcoming this contradiction are ineffective. The generally recognized shortcomings of university training are that students are overloaded with volumes of material being studied, insufficient development of independent work skills and a lack of self-realization skills (Nagima et al., 2023; Zhakupova, Kyakbaeva, Karimova, & Omarova, 2022).

However, the implementation of interactive teaching methods in educational institutions is still unplanned and unpredictable giving the perception that they are artificial and have not yet been fully integrated into the curriculum. This highlighted the need for developing, planning and implementing integrative teaching techniques consistently while collaborating with teaching staff. According to the results, using integrative teaching techniques improved students' preparedness for independent learning which is a notable advancement above traditional methods (Vashe et al., 2019).

The problem of educating a prospective primary school teacher to have a self-developing and self-improving personality requires a new focus. This contribution expands the methodological potential of university education in the context of European integration by presenting a new approach to increasing students' readiness for self-education which will help monitor the functional parameters of their professional self-development to implement at a qualitatively higher level and in a broader palette of professional qualitative characteristics.

## 2. Literature Review

In this study, special attention is paid to the primary school teacher. On the other hand, this is one of the key conditions for the development of children and their successful socialization. Consequently, a primary school teacher must be ready for self-improvement and master new competencies, i.e., carry out continuous professional education, a component of which is self-education. Al-Amri (2021) clarifies and differentiates the acquired knowledge and also indicates the forms of its acquisition. Marginson's (2023) perspective is interesting because the phenomenon being studied brings together a number of closely related notions that define, structure and enhance each other. A review of the literature on the topic reveals that most authors confine themselves to introducing techniques that consider isolated elements of self-education and pertinent ideas without taking into account how they relate to one another. Second, the authors consider the designated categories of working teachers rather than future specialists studying at universities in isolation from professional and personal development (Hyseni Duraku, Blakaj, Shllaku Likaj, Boci, & Shtylla, 2022).

It is possible to draw the conclusion that there are multiple similar concepts based on the sources' examination similar to self-education. This is referred to as "professional self-education," "psychological and pedagogical self-education" and "professional and pedagogical self-education". The authors emphasize the importance of mastering knowledge, gaining personal experience and increasing professional competence (Hilsen, Olsen, Hilsen, & Olsen, 2021).

At the same time, there is no indication in the existing interpretations of the basis for the implementation of the process under study or the logic upon which it is built. Self-education is an important factor in preparing a specialist who is capable of actively and creatively thinking and acting, developing and self-improving. In this regard, a logical transition from the learning process to professional self-education is necessary but this transition must be preceded by accompanying education. Fawns (2022) and Gamage, Dehideniya, and Ekanayake (2021) emphasize in their work that the concept of self-education is a promising direction for the development of pedagogical theory and practice acting as a condition for learning, as a process parallel to education and as a way to continue it.

The preparedness of aspiring elementary school teachers for professional self-learning needs to be considered a measure of their professional competency, the level that determines the calibre of their work (Julia et al., 2020). A prerequisite to this concept is self-awareness which establishes the course of each person's professional and personal development and helps them recognize their requirements and potential. Internal motivation for professional self-education is the result of purposeful systemic activity that begins with mastering an educational program in a specialty in a professional educational organization.

The problem of preparing a future primary school teacher for self-education as the main component of increasing his professional readiness has not been specifically studied, though certain aspects have been analyzed in the works of Robles Moral, Fernandez Diaz (2021) and others. These works contribute to the accumulation and systematization of knowledge on the subject under study as well as the study of effective experience but they are not generalizing in nature and many of its aspects remain understudied. The pedagogical conditions that ensure its effectiveness require theoretical justification. The problems of self-education and the problems of increasing a future primary school teacher's level of professional preparedness for self-educational activities were not sufficiently substantiated. Thus, the content, forms and methods of preparing a future teacher for self-educational activities as the primary component of increasing his professional readiness have not been thoroughly examined.

### 2.1. Content and Structure of RSE

Our research is particularly interested in the idea of preparation for self-educational activities as well as the willingness to carry out a particular kind of activity. The term "readiness for self-education" has multiple definitions (Geng, Law, & Niu, 2019; Roth et al., 2022). It has been defined as a dynamically developing personality characteristic based on a value- and motivation-based attitude towards independent work. It has also been defined as a person's capacity to work independently with information flows and acquire the expertise and skills needed to advance and better themselves in other studies (Serrano, Dea-Ayuela, Gonzalez-Burgos, Serrano-Gil, & Lalatsa, 2019).

The concept of readiness is polysemy which includes ability, state, agreement, attitude, mood, preparedness, system and quality. These definitions have different origins but are used in philosophy, psychology, and education. The overwhelming majority of people consider readiness for any activity to be an internal state of the individual. In self-educational activities, ability is expressed in the individual's possession of special skills, knowledge and skills based on which it is possible to carry out cognitive activity as well as the presence of physical opportunities to take independent action in their education (Cheng, Adekola, Albia, & Cai, 2022).

Readiness is manifested by the presence of interconnected structural components that form certain integrity and are organized to achieve a specific goal. The components of self-education readiness include positive, sustainable motivation for self-education; reflecting the necessary knowledge for organizing and implementing self-educational activities; procedural, including complex skills and reflexive, manifested in the ability to recognize the results of self-educational activities (Bastian, Fortner, & Caton, 2023). Researchers have not yet reached an agreement on the components of readiness (Livet, Blanchard, & Richard, 2022). It has been suggested that a person's component structure should include the following: procedural, which reflects learning activity and the capacity for self-analysis; cognitive which indicates that a person possesses fundamental beginning knowledge and skills; motivational and attitudes; organizational which represents the ability to plan one's activities; and self-control.

Other researchers emphasize that readiness for self-educational activity is a pedagogical education that reflects the development of specific successful skills for self-educational activity implementation (Millanzi, Herman, & Hussein, 2021). They combined the proposed self-education elements into three interconnected, complementary components: motivational activity which reflects motives and independent work, specialist knowledge component and skills on which self-educational activity is possible and internal constant which reflects human properties that promote or limit professional self-education possibilities. Thus, there is no single set of elements systematizing readiness for self-educational activity. Therefore, we consider it necessary to determine the component composition that satisfies the topic of our research.

### 3. Method

#### 3.1. Research Method

The study used a semi-experimental pre- and -post-test design to assess participants' scores before and after an experiment involving the same dependent variable. Pre- and post-test designs that may or may not include control groups can be used in both experimental and quasi-experimental studies.

#### 3.2. Research Sample Formation

The participants in the experiment were students from E. Buketov University in Karaganda, Kazakhstan, aged 18–25 years, nationality: Kazakhs and Russians. There were 240 participants and the language of communication was Kazakh and Russian. 20 participants were male and 220 participants were female.

#### 3.3. Experimental Process

Using interactive training methods (ITMs) in teaching, FES teachers manipulated interactive technologies. The following self-education ready criteria were selected in order to evaluate the efficacy of students' self-education processes. These criteria also served as the basis for monitoring to track any changes that transpired during the experimental work:

- 1) Motivational: value criterion (the presence of a set of motives to carry out self-educational activities).
- 2) Activity criterion: (a) quantitative indicators: ability to self-organize, the amount of time spent on self-education. b) Quality indicators: the content of self-educational activities; ability to set goals; degree of professional orientation; and self-education.
- 3) Technological criterion (availability of general skills and self-educational activities): work with sources; select a bibliography for a given topic; analyze pedagogical situations, etc.

Students' initial level of readiness for self-educational activities:

High level: The student recognizes the role and significance of self-education.

Average level: Unstable knowledge of self-education.

Low level: Students underestimate the importance of self-education in the classroom.

During the 2022-2023 academic year, the experiment was carried out at E. Buketov Karaganda University (Karaganda, Republic of Kazakhstan) with students from the second to the fourth year in the direction of training 6B01301, "Pedagogy and Methods of Primary Education." EG (n = 122) with Kazakh as the language of instruction was chosen and CG (n = 118) with Russian as the language of instruction was chosen. Interactive training methods (ITMs) were used by the EG. According to the standard program, training in the CG was traditional. The same teachers taught classes in both the EG and the CG ensuring that the experiment's requirements were met and that the educational process was effectively managed.

During the learning process, students interacted not only with the teacher but also with one another. Students solved a given educational task independently or in groups by selecting one of the proposed options or discovering and justifying their solution. The interactive lecture combined the methods of a traditional lecture and a training game. Several interactive exercises were conducted during one lecture. A teacher may ask students to provide 1-2 brief examples to support their point of view after asking a question about the lecture topic. This technology has made it possible to implement the principles of developmental education in practice. Considering the curriculum for students in "6B01301, Pedagogy and Methods of Primary Education" a set of interactive training methods (ITMs) was introduced into the educational process (see Figure 1). During the experiment, various interactive training methods (ITMs) were used to ensure the development of self-education skills in future elementary school teachers in the university educational process.

We used the following rules to ensure the successful implementation of a set of ITMs:

- 1). Students must not only learn to solve practical cognitive problems but they must also develop the need for self-education as a necessary condition for the success of future professional activities.
- 2) Teaching methods should be adapted to the group, the students' level of knowledge and their desire for self-education.
- 3) Successfully overcoming difficulties in self-education, enriching the experience of self-educational activities in general and increasing readiness for self-educational activities.

At the final stage, we offered them the following tasks:

1. Identify and formulate a pedagogical problem, the study of which will be the focus of self-educational activities (completing this task develops students' ability to find contradictions in pedagogical processes and phenomena and will allow them to realize the need to obtain additional, objective information).
2. Develop and implement an original program of professional self-education. This program should include stages of self-education, their goals and content, forecasting the progress and results of self-education and difficulties.
3. Create a map of self-observations that reflects the following: the causes of the observed pedagogical phenomena, clarification of approaches to solving the identified problem and analysis of self-education progress and results.

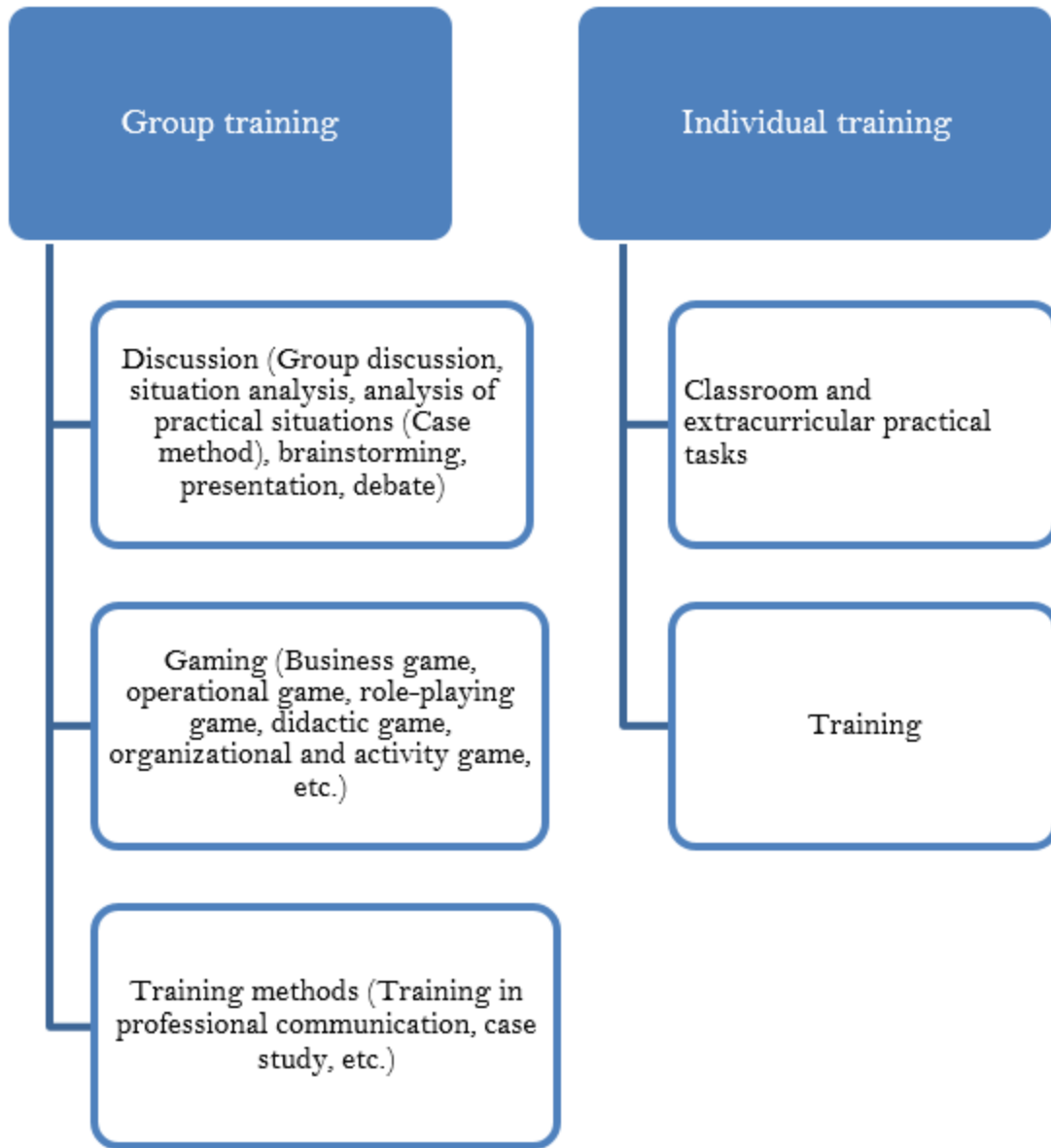


Figure 1. Content of ITMs.

The result of this work was a written presentation of the author’s program of students and a presentation at the seminar. The seminar addressed such problems as structure, organization of stages and reflection on self-educational activities during practice.

### 3.4. Instruments

To collect information, we used: (1) a test for assessing the capacity for self-development and self-education. (2) A questionnaire for diagnosing students’ self-esteem for professional preparedness for practical activities. (4) Participants’ observation.

## 4. Results

A cross-section of the pre-test revealed the following results (see Figure 2): A small number of experiment participants (28.4%) demonstrated an active tendency, the majority (64.6%) revealed a strong dependence on self-education and learning conditions and a group of participants (6.2%) demonstrated the absence of dynamics in these processes. Next, factors that impede the self-development and self-education of experiment participants were identified. The first among them is the lack of special conditions at the university.

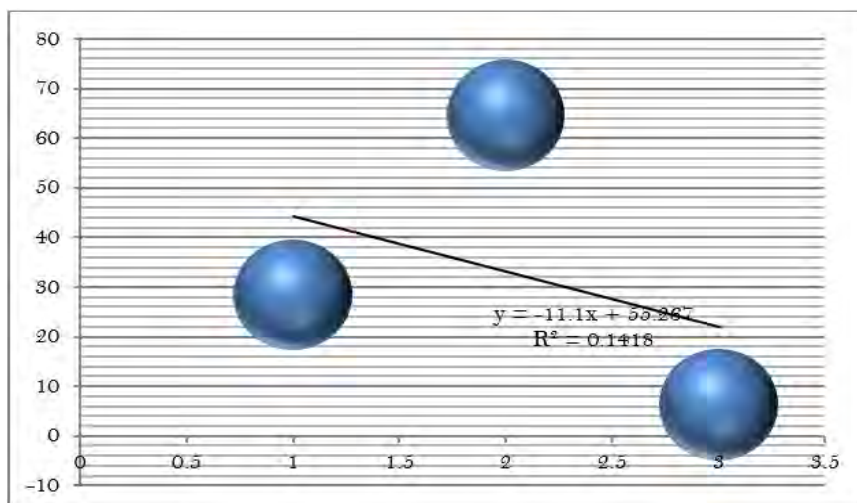


Figure 2. The pre-test results of FES teachers’ RSE.

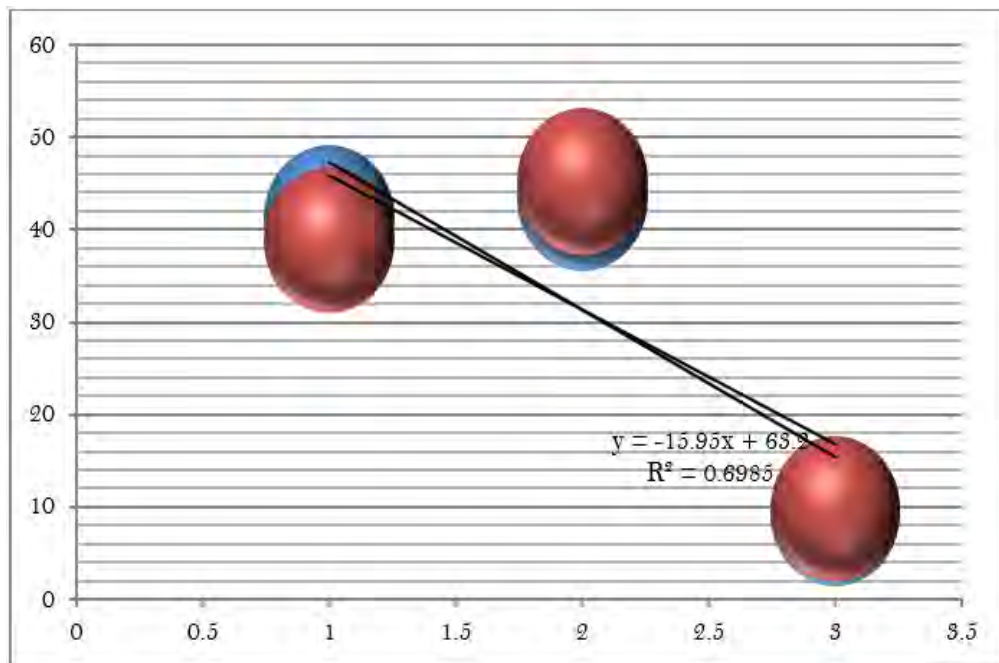
Diagnostics of the average level of development of RSE in the participants (see Table 1).

**Table 1. Pre-test results of FES teachers' RSE.**

Levels of RSE	CG	EG
High (40-60 score)	9.3%	9.8%
Average (20-40 score)	43.4%	45.2%
Low (0-20 score)	41.2%	38.8%

According to the table, the experimental group EG has a higher level of control group CG (9.8%) than the control group CG (9.3%). The EG (45.2%) has a higher average level of CC than the CG (43.4%). The EG has a lower level of CC (38.8%) than the CG (41.2%).

According to the pre-test results the EG and CG (9.8% and 9.3%, respectively) have a high level of development in FES teachers' RSE. On the other hand, participants from the EG (45.2%) and CG (43.4%) demonstrate an average level of development of FES teachers' RSE. Participants in both groups, EG (38.8%) and CG (41.2%) have insufficient (low) RSE development (see Figure 3).



**Figure 3. The generalization of the pre-test results.**

The findings corroborated the assumption about the need to create special conditions, stimulating students to engage in self-education. At the same time, we took into account factors that positively influence this activity:

- 1) Motivation for self-education as the basis for students' desire for active, independent cognitive activity.
- 2) Consideration of the psychological and pedagogical characteristics of learners who are in a favorable period of inclusion in self-education.
- 3) Stimulation of participants' independent activity at each stage of their university education.
- 4) A systematic and unified focus on types of work ensures the development of self-educational activities.

The next phase of the study was to establish specific pedagogical circumstances for preparing teachers for work in primary schools focusing on active self-education using interactive teaching methods. The experiment program covered all levels: the educational process, extracurricular work and teaching practice.

Purposeful work on the development of self-education among students included:

1. The curriculum included special courses in the development of students' self-educational activities. (1) The selection and processing of educational topics based on the inclusion of differentiated and individual tasks. (2) The use of task-appropriate interactive forms, methods and techniques of teaching.
2. A set of extracurricular activities that develop motivation for students to actively engage in self-education, including electives, individual classes and their participation in other creative and research associations.
3. Students in the faculty of education received specialized training in targeted self-education techniques (self-knowledge, self-analysis, self-testing and self-assessment) through various forms and methods (self-stimulation and self-instruction) used in classes and extracurricular activities.

The primary focus in the development of self-educational activities was on the independent cognitive activity of students. Studying the developed courses using interactive teaching methods was focused on developing a positive emotional attitude towards academic work, the need for self-education and operational new formations: critical thinking, the ability to lead a discussion, the ability to pose problematic issues, justifying one's position and adequate self-esteem.

The data was obtained during the survey to identify the level of RSE of FES teachers in the EG (see Table 2).

**Table 2. The level of RSE of FES teachers in the EG.**

Levels of RSE	CG			EG		
	Pre-test	Post-test	Growth	Pre-test	Post-test	Growth
High (40-60 score)	9.3%	11.4%	2.1%	9.8%	32.1%	22.3%
Average (20-40 score)	43.4%	45.4%	2%	45.2%	49.8%	4.6%
Low (0-20 score)	41.2%	38%	3.2%	38.8%	12.2%	26.6%

The table demonstrates that the EG's high level of CC (32.1%) is greater than the CG's (11.4%) and the EG's CC growth (22.3%) is greater than the CG's (2.1%). EG had a higher mean level of CC (49.8%) than CG (45.4%) and EG had a higher CC increase (4.6%) than CG (2%). In comparison to the CG (38%), the EG's low level of CC (12.2%) is lower.

The study demonstrated that the proposed program using interactive teaching methods provided opportunities for RSE by FES teachers in the process of preparing them for work in primary school because participants in the EG were at a higher level compared to the same indicators in the control groups.

The dynamics of the RSE of FES teachers in the experimental group at the pre-and post-tests are presented in the diagram (see Figure 4).

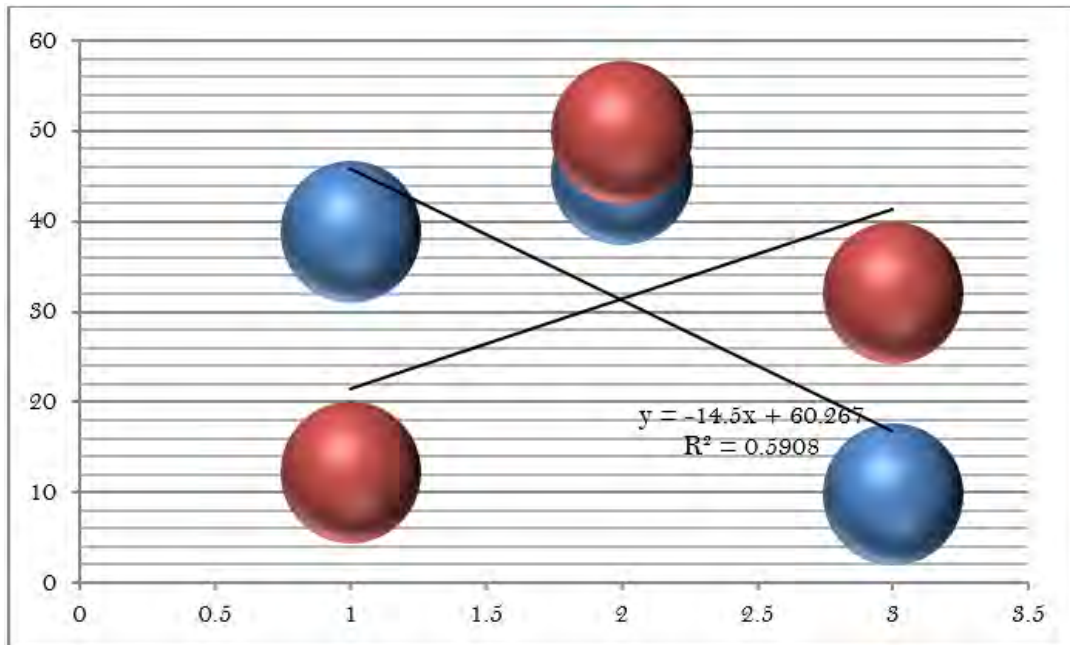


Figure 4. The dynamics of the RSE of the EG.

There has been a qualitative and quantitative increase in the post-test results in the EG when compared to the pre-test results that showed the RSE of the FES teachers. Students' RSE rose from 9.8% to 32.1% at the high level. As a result, a 22.3% increase was observed. The average RSE level of the students rose by 4.6% from 45.2% to 49.8%. The RSE of students dropped from 38.8% to 12.2%, a 26.6% difference. The calculations showed that the efficiency coefficient of the experimental system is higher which proves its advantage in comparison with the usual one in the control group. The study demonstrated that using ITMs in a university's educational process significantly increases future primary school teachers' readiness for self-education (RGE).

## 5. Discussion

It is possible for teachers to ensure that future elementary school (FES) teachers acquire self-education abilities by researching how students' RSE develops and how interactive training techniques (ITMs) affect it. This would greatly increase the preparedness of future primary school teachers for self-education (RGE).

This result demonstrates that using interactive training methods (ITMs) in teaching FES teachers manipulate interactive technologies to determine the students' self-education readiness criteria which served as the foundation for monitoring to track changes that occurred during the experimental work (González-Betancor, Bolívar-Cruz, & Verano-Tacoronte, 2019).

The implementation of a set of ITMs in the EG assisted students in learning to solve practical cognitive problems and also successfully overcoming difficulties in self-education enriching the experience of self-educational activities in general and increasing readiness for self-educational activities. Teaching methods were adapted to the group, the students' level of knowledge and their desire for self-education. The special training for students' targeted self-education techniques was carried out in various forms and methods in classes and extracurricular activities (Kara Erol, 2023; Mok, Rupp, & Holzberger, 2023).

The participants' EG developed an innovative program of professional self-education. This program included stages of self-education, their goals and content and forecasting the progress and results of self-education. They created a map of self-observations that reflects the following: the causes of the observed pedagogical phenomena, clarification of approaches to solving the identified problem; and analysis of self-education progress and results. As a result, it was discovered that EG participants were able to successfully identify and formulate a pedagogical problem, the study of which served as the focal point of their self-educational activities that enhanced students' capacity to recognize inconsistencies in pedagogical phenomena and processes and made them aware of the necessity of gathering more unbiased information. Finally, participants in EG gave a written presentation of the author's student program as well as a presentation at the seminar. In the seminar, students actively discussed issues such as structure, stage organization and reflection on self-educational activities during practice (Hußner, Lazarides, Symes, Richter, & Westphal, 2023).

As a result of studying the developed courses using interactive teaching methods, participants' positive emotional attitudes towards academic work, the need for self-education and operational new formations such as critical thinking, the ability to lead a discussion, the ability to pose problematic issues, justifying one's position and adequate self-esteem were developed.

This result is also consistent with what was found in the investigation by Li, Heydarnejad, Azizi, and Rezaei Gashti (2022); Namaziandost, Heydarnejad, and Rezai (2023) and Othman, Hashim, Ariffin, Abdullah, and Yusof (2019).

Thus, the assigned tasks have been completed and the research work's goal has been met. The research hypothesis was confirmed. Using ITMs in a university's educational process will significantly increase future elementary school teachers' readiness for self-education (RGE).

## 6. Conclusion

This study explored the effects of ITMs on the fostering of RSE for FES teachers. A diagnostic study carried out on the distribution of future teachers by level of RSE revealed the insufficient preparedness of students to organize self-educational activities which necessitated the need to find ways and means of effectively developing the RSE of FES teachers. Technologies for organizing gaming activities, technology for situational learning, technology for organizing students' project activities and information technologies were used when conducting classes in EG. The study's control stage results show that it has helped EG students become highly prepared for self-education. The use of ITMs influenced students' motivations for self-education positively. Furthermore, the availability of general skills and self-educational activities helps FES teachers produce and create the presence of skills to carry out self-educational activities. This study confirmed the hypothesis that we put forward that a technological approach using ITMs in the university educational process significantly fosters future elementary school teachers' readiness for self-education (RSE).

## 7. The Suggestions and Future Implications

When determining the research prospects, it should be noted that additional research on the problem under consideration can be aimed at improving diagnostic tools and a young teacher's self-diagnosis.

Furthermore, the development of professional self-education for teachers in small-class and private schools will enrich the data obtained.

Some issues also require special study in particular the development of strategies for managing the self-educational process of teachers at elementary schools. Improving the self-education of teachers in an educational organization will be carried out effectively if social and pedagogical conditions are purposefully created including optimization of the structure of the methodological service of the educational organization, development of the actual content of methodological work following the educational needs of teachers and inclusion of teachers in professional groups and communities in an open educational space for the dissemination of teaching experience.

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