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## Innovation in Higher Education: A Study of an Interdisciplinary Experience of Challenge-Based Learning (CBL) in Early Childhood Education Teacher Training

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**Abstract**

The aim of this study is to analyse the impact of the application of the active methodology called Challenge-Based Learning (CBL) on the development of generic competences in university students through their participation in an interdisciplinary project that brought together several subjects. The study was carried out based on an action research design within the framework of an educational innovation project in its third year of implementation. A total of 113 students from the second year of the Degree in Early Childhood Education at the University of Huelva participated throughout the semester, designing an educational experience focused on children between three and five years of age, applying the Challenge-Based Learning (CBL) methodology. At the end of the semester, the students responded to a survey in which they assessed the degree to which their participation in the innovation project favoured the development of their generic competences, as well as the benefits and difficulties related to the application of active methodologies in university studies. The results show the suitability of the use of active methodologies, in this case the CBL, for the development of competences in university students, especially those related to collaborative and autonomous work, oral and written communication skills, initiative and entrepreneurship, recognition and respect for diversity; as well as social responsibility, civic and professional ethics.

**Keywords**: active methodologies, Challenge Based Learning (CBL), university studies, globalised learning, interdisciplinarity, competences.

## 1. Introduction

Research carried out throughout the 20th and 21st century on the way we learn and the means of learning has brought to light some fundamental elements on which a good number of

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experts seem to agree: the relationship between previous and new knowledge, the need to give meaning to the contents learned through their contextualisation and use in social and empirical life, as well as the fundamental role of collaborative work with the students themselves and the teaching staff in order for the educational process to be successful (Frolova, Rogach, 2021; Luch, Portillo, 2018; Pozo, Pérez, 2006).

On the other hand, there is the need to incorporate educational proposals whose main objective is to train people for life, for well-being, for understanding and acting in the world in which they live. To this end, Zabala (1999) points out that meaningfulness and functionality are requirements for learning, and proposes the application of a globalising approach that encourages students to develop complex thinking in order to identify the scope of each of the problems that intervention in reality poses and to choose the conceptual and methodological instruments from any of the different fields of knowledge which, by relating and integrating them, will enable them to solve (p. 31).

In order to enable people and countries to respond to the challenges of today's and tomorrow's world, nations have been creating policies and legal frameworks that foster the development of strong education systems capable of meeting these demands including the entire population. This is, for example, the central idea behind the creation in 2018 of a common education framework in the European Union: "The European Education Area initiative helps EU Member States to work together to develop more resilient and inclusive education and training systems" (European Union Education Area).

In 2017 the European Union published the document called Renewed European Agenda for Higher Education, which emphasises the urgency of having an effective and efficient higher education for the development of European societies and, to achieve this, it proposes a series of actions to be implemented in the universities of the member countries among which the following stand out (pp. 6-7): the creation of inclusive and connected higher education systems that address Europe's social and democratic challenges as learning communities linked to their contexts; the development of programmes and curricula that focus on the learning needs of students, enabling them to understand and respond appropriately to the needs of individuals and to pursue lifelong learning; the promotion of students' acquisition of skills and experiences through activities based on real problems; the conception, construction, and implementation of curricula with teachers who are pedagogically trained and whose professional development is continuously and systematically promoted.

Awareness of the growing demands of the complexity of global society together with the conviction that learning processes must be promoted in accordance with human needs, widely demonstrated from the physiological, psychological, pedagogical and social points of view, make a committed and transformative response necessary on the part of teachers, especially those dedicated to Education Sciences, who play a substantial role in the training of people who will become teachers, make a committed and transformative response necessary on the part of teachers, especially those dedicated to Educational Sciences, who play a substantial role in the training of people who will become teachers, as they can become role models in their own educational work with students (Sánchez, 2019).

In this sense, the educational innovation project presented here has sought to respond to the needs and urgencies of our contemporary societies through the application of the active methodology called Challenge-Based Learning (CBL) with the dual purpose of promoting the development of generic and specific professional competencies of university students, and at the same time, to promote awareness of the most relevant needs that exist in their context. These needs would be addressed as a vehicle for their own learning and that of their students, by designing globalized and meaningful educational experiences.

The results obtained through the implementation of this project show the relevance of the application of active methodologies with a globalizing approach that addresses the educational purposes of the students' competence development, the necessary educational transformation of basic education, and the impact of the university on society. It also shows the keys to interdisciplinary work in university subjects, its benefits for student learning and the challenges it poses for teachers.

CBL emerged in the technology company Apple (Nichols et al., 2008) as a working methodology to achieve its objectives. The benefits of its application in the business environment prompted the company to propose it as an educational methodology generating a series of

guidelines and proposals for its consolidation. According to Fidalgo et al., (2017) it is a "method that includes cooperative learning, the vision of problems that globally affect all humanity and the applied vision of various academic subjects [...]. It usually encompasses actions carried out by the educational centre as it needs to integrate knowledge from various subjects" (p. 1).

This methodology has experienced a growing increase in higher education institutions, fostering students' transversal competences, knowledge of socio-technical problems and collaboration with industry and community agents (Gallagher, Savage, 2020). Despite its recent implementation in education and the need for adjustments and standardisations in its application, several institutions show a predilection for it, even over others such as Project-Based Learning (PBL) or Problem Based Learning (PrBL). CBL achieves greater student involvement in understanding, tackling and solving the challenges posed since these are real, relevant, open, and take place in their context which requires them to implement multiple and varied competences, all this in the hands of teachers and experts in the subjects addressed; in addition, of course, to a close collaborative work process with their teammates (Observatorio de innovación educativa, 2015).

The elements and phases included in the CBL in its educational application are (Idem, p. 12):

- General idea: it is a concept whose range allows for multiple explorations; it is relevant and attractive to students and society, for example: biodiversity, health, sustainability, democracy, and equality among others.

- Essential question: this is the question, among all those that can be created from the chosen topic, which reflects the needs and interests of the students and the community. It serves as a guide to focus them in the development of their project.

- Challenge: this is a challenge, task, activity or situation that students must solve through their project. It arises from the two previous elements and generates a concrete and significant action to be carried out by the students in a local way.

- Guiding questions, activities, and resources: these are the elements that students must design, carry out, and use to solve the challenge in a realistic, innovative, and deep way.

- Solution: it can be one or several, since the scope of each challenge allows various forms of action to reach it. It must be characterized by its concreteness, articulation, and feasibility of successful implementation.

- Implementation: the solution must be performed in a real environment.

- Assessment: it should take place before, during and after the solution to the challenge in order to guide the student's process, making the appropriate decisions to improve learning and favour the achievement of the objectives. It should focus on the development of competences evidenced both in the solution to the challenge and in the process of achieving it.

This methodology has an impact on improving academic performance by promoting student motivation in the implementation of its phases as well as the integrated development of specific and transversal competences, and it is considered very suitable for developing students' innovative and research profile competences. It develops digital culture, innovation and critical thinking, and communication skills as well as teamwork, leadership, time management, project planning, and project development; socioemotional skills such as resilience, self-management, autonomy, collaboration, and empathy are also reinforced with the use of this methodology (Universidad Politécnica de Madrid, 2021: 17).

The CBL is an educational methodology that achieves positive results even in the first school years (Castro, 2019; Felices, 2023), thus showing that it is applicable by adapting its phases and the challenge posed to the characteristics and needs of each group in which it is used. For this reason, it was considered to be the most relevant methodological innovation option for the purposes of the design and implementation of the interdisciplinary project described below.

## 2. Materials and methods

This study was carried out on the basis of an action research design within an educational innovation project in its third year of implementation. The participating teachers designed a Challenge-Based Learning experience to promote the development of generic competences of students in the second year of the Bachelor's Degree in Early Childhood Education.

A total of 113 students participated in the study. There were three subjects involved in the project: Didactics of Mathematics, Didactics of Foreign Languages (English), and Health and Consumer Education.

The students were divided into groups of four to two people. Each group should choose one of the three possible grades of the second cycle of Infant Education (3, 4 or 5 years), and elaborate a proposal for a trimestral design of work in which the CBL methodology was applied. This had to meet three fundamental requirements: 1) be aimed at solving a challenge linked to the context of the school and group in which the proposal would be placed; 2) address at least one of the 17 Sustainable Development Goals as a general idea; 3) promote the integrated development of the competences of the three areas of Early Childhood Education in each of its phases.

As a complement to the use of CBL, the GRASPS tool (Goal, Role, Audience, Situation, Product/Performance and Purpose, Standards and Criteria for Success) was used. This is an inverted learning strategy in which an educational experience is described for the students where the following is specified: the goal to be achieved or challenge to be met, the role that each person has, the target audience, the situation, the subject matter and the context in which it will be carried out; the purpose or product that is expected to be generated and the standards and criteria for success (Egas, 2018).

For the fulfilment of this project, preparatory activities for the initial training and orientation of students were designed and carried out:

1) An educational visit to the Centro Andaluz de Arte Contemporáneo in Seville, which included a guided tour of the site and a complex explanation with an inter- and transdisciplinary vision of its history, construction, uses, and renovations over time and the participation in the temporary exhibition "De ida y vuelta" by the Spanish artist Cristina Lucas. The aim of this experience was to highlight the network of interconnections between the different elements that make up the world and the complexity of the reality: people as biopsychosocial beings, nature and socio-political, and economic systems. The author makes use of a wide range of materials and resources in her exhibition, from a complex approach to the themes and techniques dealt with through which visitors become aware of the urgency of a change of direction for humanity focused on the holistic wellbeing of everyone in harmony with the world and each of the elements that composes it (Centro Andaluz de Arte Contemporáneo, 2023).

2) An initial introductory and training seminar for the solution to the challenge where a general explanation of learning from the globalised approach, the justification of its necessity, the means, methodologies, and resources to favour it, inside and outside the educational context, and two examples of educational experiences, already implemented were analysed, focused on children in Early Childhood Education, aimed at the development of competences through transdisciplinary and globalised educational situations in which children participated actively and collaboratively in real or realistic situations, where they achieved a series of objectives and their previous knowledge, interests, and needs played a fundamental role.

Once the seminar had taken place, the subjects continued to operate in accordance with the stipulations of their teaching guide, with the intention of encouraging the greater penetration and naturalisation of the methodological components of the project (CBL, interdisciplinarity, complexity...) in their daily lives.

The subject of Health and Consumer Education was responsible for presenting and explaining the Project's descriptive document in detail. in this subject, the students requested tutorials (at least one in each group) to clarify the characteristics of the project and the way in which it should be carried out.

Approximately one month after the start of the Project, the students were asked to make a brief presentation with detailed information about their educational proposal, receiving feedback from the teaching staff. This activity was very useful for the adaptation and redirection of their proposals, so that, once they had an adequate basis, they were able to continue with the design of the subsequent phases.

In the three participating subjects there were different moments in which the project was addressed, asking the students to explain the challenge chosen for their project and the context in which they would develop it, as well as the way in which they proposed globalised learning and the integration of all the competences with the challenge as the fundamental node.

As an example, a summary of the proposal made by a group of four students is presented. The name they chose for their educational proposal was "Messengers of the sea" focused on the 5-year-old class of a school in the town of Mazagón, Huelva. The students addressed SDG 13 "Climate action" and SDG 14 "Life below water". The challenge set by the group was to carry out a series of awareness-raising actions for the students, teachers and families of the chosen school, as for the rest of the

community, with the aim of promoting care for the environment, especially beaches, reducing waste generation and reuse or recycling of waste, as well as carrying out activities to preserve the environment in the best possible conditions. All this will be achieved through three main actions: 1) travelling exhibition of real information from reliable sources on environmental pollution (collected, analysed, and systematised by the children themselves); 2) making toys by reusing waste found on the beach by the children themselves; 3) a play created, directed, and acted by the children, which will be open to the public and will show the pollution problems suffered by the coast of Huelva and the possible solutions in which each person can collaborate.

Following the action research process (Hernández et al., 2010), once the project was implemented, data was collected on the students' experience and learning, through a survey specially designed for this research, validated by expert judgement and with a piloting process prior to its application. The survey is divided into five sections: general information, development of generic competences, assessment of the CBL methodology, comparison with other subjects in the degree programme, and assessment of the educational experience. Most of the survey used questions that were answered using Likert-type scales with five grades ranging from: not at all, to completely. Some open-ended questions and one multiple-choice question were also included, thus obtaining quantitative and qualitative data.

The survey was carried out using Google forms and it was answered by 58 students. The information obtained was processed using SPSS v.21.

Once the general process of the innovation project was completed, a meeting was held with the participating teachers, in which they responded individually to a survey in which they recorded the strengths, opportunities, weaknesses and threats (SWOT) of the project.

### 3. Results

The information obtained through the survey yielded a series of relevant descriptive data, which allows us to make a first and incipient approximation to the experiences of the participating students.

94.7 % of the students who responded to the survey are female. Of the total number of participants, 93 % are aged between 20 and 25, 5.3 % between 26 and 30 and 1.8 % between 31 and 35.

All of the respondents took part in Didactics of Mathematics, while 93 % of them also took Health and Consumer Education, and 82.5 % took Didactics of Foreign Language (English).

In terms of participation in the preparation and training activities for the implementation of the CBL project, 61.4 % attended the Centro Andaluz de Arte Contemporáneo, while the majority (91.2 %) attended the induction seminar, with only 7 % not attending and 1.8 % partially attending.

The students were asked about their perception of the development of the generic competences of the Bachelor's Degree in Early Childhood Education through the project. Cronbach's Alpha analysis of student responses showed a high level of reliability (0.967). The list shows those they considered to be most developed:

**Table 1.** Competences with the highest degree of development through the project

| Competence | Average raiting |
| --- | --- |
| Working collaboratively | 3.89 |
| Working autonomously with initiative and an entrepreneurial spirit | 3.79 |
| Ability to communicate correctly orally and writing in the mother tongue | 3.77 |
| Ability to relate positively to others | 3.75 |
| Recognition and respect for diversity and multiculturalism | 3.73 |
| To behave ethically and socially responsible as a citizen and as a professional | 3.70 |

The rest of the competences analysed have averages between 3.23 and 3.69, which shows a medium to high development of them in the process. It is worth noting that there were only two competences with a percentage of less than three: Knowledge of other cultures and customs (2.96 points) and Knowledge and communication in foreign languages (2.88 points). It is noteworthy that despite the participation of the subject of Didactics of Foreign Languages (English), these two generic competences, which are most directly related to it, received the lowest

marks. The ability to integrate and communicate with experts in other areas and in different contexts was the third with the lowest score, reaching 3 points out of 5.

A correlation analysis was conducted between the different generic competences of the students, finding that those that have the highest correlation with the rest are, from highest to lowest: the ability to assume the need for continuous professional development through reflection on one's own practice, and the ability to integrate and communicate with experts in other areas in different contexts; the ability to search for and manage information; the ability to detect one's own learning needs throughout life; and, lastly, creativity or the ability to think about things from different perspectives, offering new solutions to problems. This analysis also revealed low correlation scores between knowledge and communication in foreign languages and the rest of the competences analysed.

In order to compare the experience in the project with the rest of the subjects studied in the Degree in Early Childhood Education, some complementary questions were asked, from which the following results were obtained:

- The majority of students (47.4 %) agree that the development of generic competences was greater in the interdisciplinary project than when working in a disciplinary manner and with non-active methodologies or methodologies not centred on work in real contexts, while 25.3 % strongly agree and 8.8 % totally agree. On the other hand, we found that 14 % slightly agreed and 3.5 % disagreed.

- Most of the students agreed that participation in the interdisciplinary project was key to the integration of their learning (36.8 %), while 29.8 % strongly agreed, and 14 % strongly agreed. Only 7 % disagreed and 12.3 % disagreed slightly.

- When assessing the Challenge-Based Learning (CBL) methodology, it was found that the majority of students agreed or strongly agreed that the project increased their confidence in carrying out their teaching work (33.3 % in each case), while 12.3 % strongly agreed, 12.3 % slightly agreed and 8.8 % strongly disagreed.

- Comparing with other methodologies (lecture, example analysis and annotated reading), most of the students (45.6 %) indicated that they strongly agree that CBL promotes their learning to a greater extent, while 21.1 % strongly agree and 19.3 % agree. Only 1.8 % strongly disagreed, while 12.3 % slightly disagreed.

- The degree of agreement decreased when the statement "The participation in the interdisciplinary project was key to the integration of my learning" was made, since the majority of the percentages were between: agree (32.1 %), slightly agree (16.1 %) and disagree (14.3 %). There were 28.6 % of students who strongly agreed, and 8.9 % totally agreed.

It is worth highlighting the results of the assessment of the benefits promoted by the CBL methodology in relation to the students' experience. The following table shows the benefits from highest to lowest percentage:

**Table 2.** Benefits of the CBL as perceived by students

| Benefits of the CBL | Percentage |
|---|---|
| Promotes collaborative learning with peers and teachers | 81.8 % |
| Exercises in research, argumentation, and expression, both oral and written | 69.1 % |
| Promotes awareness of the needs of the environment | 69.1 % |
| Improves the autonomy and self-esteem of pupils | 67.3 % |
| Encourages the development of critical and creative thinking | 60 % |
| Requires interdisciplinary work | 60 % |
| Motivates learners to participate by giving meaning to their learning | 60 % |
| Generates students to act in reality by learning and putting into practice what they have learned | 60 % |

The students were asked to compare this experience with the rest of the subjects they had studied so far in the Early Childhood Education Degree. The questions and results were as follows:

– 41.1 % of the students indicated that, of all the subjects studied in their university degree, only in some they have carried out activities in which the learning is applicable in reality, while 32.1 % indicated that they have done so in few of them, and 12.5 % in none. On the other hand, 10.7% said most of them and 3.6 % said all of them.

– 47.4 % agree that they have learned more in the subjects in which they have carried out activities linked to the practice of their profession, while 22.8 % strongly agree, and 8.8 % totally agree. We also find an equal percentage of people who strongly disagree or slightly agree: 10.5 % in each case.

Some questions were included to assess overall satisfaction with the project, both in terms of its design, the process of implementation, interaction with the teaching staff, and the work carried out within the team. In general, a medium to low level of satisfaction was observed, with the exception of team work, where most of the percentage was between totally satisfied (43.9 %) and very satisfied (42.1 %), with the third position being satisfied (12.3 %) and only 1.8% not very satisfied. When applying the reliability analysis, the result was acceptable (0.766) through the Cronbach's Alpha test.

The survey applied to the students allowed the inclusion of a comment in relation to their individual experience in the project, obtaining the following information: they state the need and convenience of carrying out this type of project to favour the training of future teachers, significant learning through practice and research as the basis for interesting and effective learning. In relation to the aspects that they also valued favourably; the majority indicated their conviction about the importance of carrying out activities focused on the reality of the teaching work that they will carry out in their professional careers. In most of the comments, the need to improve some aspects was detected: the organisation of the teaching staff and the meaning of the project within each subject; the design of a clear and coherent explanation of its objectives, process and assessment; the planning which provides more time for design and execution, with specific guidelines and characteristics of the assessment from the beginning of the course; the gradual monitoring of the work done through the delivery of drafts, and attendance at tutorials to incorporate the appropriate corrections prior to the final delivery.

As a complement to the assessment made by the participating students, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was applied. Both, the teachers who participated directly in the project and those who collaborated indirectly in its different phases, were taken into account, with a total of nine responses. A summary of the results is shown below.

Strengths: commitment of the teaching staff; greater learning on the part of the students who showed involvement; relationship achieved between the various subjects; collaborative work with a common methodological framework; design of the work script, evaluation rubric, and survey.

Weaknesses: low percentage of the work carried out by students in the final grade for each subject, which does not correspond to the effort required for its completion and revision; excessive increase in the workload for the teachers involved, both in monitoring students and in assessment and tutoring; coordination difficulties among the participating teaching staff due to incompatibilities in terms of timetables and workload; lack of experience and extensive training of the teaching staff in CBL methodology; suppression of some content or a superficial approach to them in the three subjects in order to dedicate time to the project. Regarding Didactics of foreign languages (English), its presence in the final elaboration of the students' educational proposals was not very significant, showing a minimal impact on the achievement of its learning objectives.

Opportunities: inclusion of new subjects and participants for the next academic year; systematisation of a more efficient proposal in the use of time and more effective in the achievement of the objectives to enable its implementation in other degrees and subjects; planning each of the phases, especially the evaluation, specifying all its characteristics from the beginning; using the available technological tools to improve the organisation of the teaching staff; updating the teaching guides to favour the best development and use of the project; dissemination of the results within the different departmental areas; congresses, University of Huelva training days to achieve recognition by the competent university authorities as a pioneering project in the Degree in Early Childhood Education; the intervention with students of an expert person who can be in charge of assisting, with specialised criteria, the demands on the general project, or establishing agreements with the teaching staff of subjects in the field of Didactics so that this methodology is approached in greater depth from the first semesters of training; stating a specific number of compulsory tutorials to monitor the development of the students' proposals.

Threats: student resistance to experimenting with educational methodologies other than the traditional ones, resulting in a lack of interest on the part of a large number of students; decrease in teacher participation due to an increase in their workload; lack of teacher training in fundamental elements for educational innovation.

#### 4. Discussion

As evidenced by the results shown, it is confirmed that the use of active methodologies at university level is a solid and effective proposal for the development of competences, with collaborative learning standing out among all of them. According to Pozuelos et al. (2020, p. 407), this competence has undergone significant advances in recent years, generating common experiences that respond to complexity and create meaning. However, it is considered necessary to favour the development of self-learning and self-regulation so that students are able to go beyond the guidelines set by teachers, broadening the horizons of their research, training and action.

The students indicated that the work shared with their teams was highly satisfactory, which may be directly related to their perception of greater development of this competence. These perceptions coincide with the work of Lavega et al. (2013), who carried out an intra and interdisciplinary learning experience similar to the one presented here and found that the assessment of the participating students in terms of the acquisition of competences focused their highest percentage on interpersonal relationship skills, i.e. teamwork.

Although collaborative work among students is fundamental, this collaborative work also refers to cooperation with teachers, where the results were the opposite, i.e. the degree of satisfaction was significantly lower. According to the characteristics of CBL, this type of methodology benefits the relationship and communication with experts in the areas in which it is applied, which, according to the results shown, did not happen either, so it will be necessary to make adjustments in the organisation of this learning experience to emphasise collaboration with the three aforementioned figures.

Coinciding with which is considered to be the main benefits of CBL (Observatorio de Innovación Educativa, 2015; Universidad Politécnica de Madrid, 2021), we found that students did indeed see their awareness of the reality of the environment develop, improving their autonomy and thinking skills, as well as their ability to act in a real learning/action/learning process. The development of their communication skills, autonomy and self-esteem was also highlighted.

The design of future CBL experiences should enhance other fundamental competences that were rated with lower scores by students: innovation and entrepreneurship; critical and complex, logical and creative thinking; self-management particularly before the difficulties that have been shown to learn in ways other than the traditional way, it will be necessary to enhance the ability to adapt to new situations closely related to resilience (Universidad Politécnica de Madrid, 2021).

In regard with the interdisciplinary work that this type of project normally requires, it was noteworthy that the students' responses expressed the difficulty of finding the relationship between the subjects in the design of their educational proposals, highlighting the need to deepen the encounter between competences and contents, and to generate nodes that facilitate the synthesis of learning with a high level of complexity (De la Tejera et al., 2019).

With regard to the teachers' remarks about a certain "dilution" of the subjects, it would be necessary to reflect on whether this observation refers to a difficulty, a lack or a weakness, or, on the contrary, whether it is a positive effect pursued precisely because of their interdisciplinary perspective, in which what is most useful and necessary in each subject is maintained and strengthened in relation to other fields of knowledge. As Evandro Agazzi says: "the real challenge of an interdisciplinary study consists, on the one hand, in taking the different disciplines as a starting point, respecting their specificity of concepts, methods and logics and, on the other hand, in working so that all this does not become a "barrier" to communication" (2002, p. 245). It is, therefore, necessary to look for the best creative and innovative ways to achieve the fusion of subjects, so that each one is necessary and useful for the generation of new learning in which the contribution of each disciplinary field, placed in dialogue with the others, continues to be fundamental.

In addition to the above, it is necessary to make more and better use of the project and its methodology to address the contents of the subjects involved, so that they acquire meaning by relating them to a real situation of interest and relevance to the students. All this will enhance the learning of the disciplines separately, and the project as a conglomerate of their competences.

According to the results of the survey, in the experience of the participating Early Childhood Education students, it has not been frequent in their experience as university students to carry out learning activities related to the reality and practice of their profession, which coincides with numerous studies that have analysed the use of active methodologies in the university environment (Jiménez et al., 2020; Cid et al., 2009; Martínez et al., 2007; MEC, 2006). This shows that, despite the theoretical and regulatory efforts developed by national, supranational, state and local

educational organisations, it is necessary to continue working in a continuous and professionalising way on teacher training for the transformation of their educational work to promote student learning.

In relation to the above, and contrary to what was expected according to research on the benefits of the application of active methodologies on student learning, the results show that the application of CBL in this context is not directly related to a broad student perception of increased learning. These results make it necessary to analyse in detail the development of the process from the beginning in order to elucidate the limitations that prevented the potentiality of learning. The students' comments raise some of them, such as the organisation of the phases and activities to be carried out by teachers and students.

Both the survey and the SWOT analysis showed the complexity involved in the design, implementation, monitoring, and evaluation of this type of educational proposal due to the demands of preparation, sharing with other members of the teaching staff, agreements on assessment and even modifications to subject programming, tutoring, and evaluation, all of which require a considerable amount of time that university teaching staff have very little of. In this sense, the example of the research carried out by Lavega et al. (2013) could be taken into account, distributing all the student teams among all the participating teachers, who, in each case, would be responsible for tutoring them in everything related to the project throughout the course.

The fact that both students and teachers agree on the lack of presence of foreign languages in the whole project and its meaning leaves open the question of how to tackle this problem and make foreign languages a part, even a central part, of learning, relationships, and the life of the institutions.

In order to confirm whether there are significant differences between the development of competences that can be achieved through the application of CBL, as an active methodology, and other educational methodologies with different levels of student involvement and activity, it would be convenient to undertake a new study similar to the one carried out at the University of León by Robledo et al. (2015). The authors designed a study that allowed them to find out the students' perception of the development of their competences through different active methodologies. Another example of this type of design is the one used by Hursen & Fasli (2022), who applied two different methodologies to two groups of students and assessed the results of both on their learning. In this sense, and having at least two groups of students, it would be interesting to apply CBL with one of them, and with the other a similar active methodology model, such as PBL, to enable comparison between both methodologies and their degree of suitability in the university context.

## 5. Conclusion

In the light of the results obtained through the student survey, as well as the feedback received by the teaching staff through their SWOT analyses, it can be concluded that the application of active methodologies at university level has a positive impact on the development of student competences, mainly collaborative and autonomous work, oral and written communication skills, initiative and entrepreneurship, recognition and respect for diversity, as well as social responsibility, and civic and professional ethics.

However, it also became evident that its implementation requires time and gradual adjustments based on the evidence of learning and the experiences of the participants, so that the level of effort required for its implementation is adequate to the quality of results that both, students and teachers, would expect.

It is, therefore, necessary to continue with its implementation, improved according to the results and analyses carried out, in order to avoid making the mistake of "the episodic nature of university innovation [which] is almost a glass ceiling that is difficult to break. There are many attempts, but a few innovations that manage to consolidate and constitute a new teaching logic different from the previous one" (Pozuelos et al., 2021: 71).

In relation to the previous point, we conclude the need to disseminate projects such as this, their process, scope, and usefulness, since achieving a methodological change in university teaching requires, in addition to the active participation of teaching staff and students, the collaboration of all levels of the institution and the administrations involved (Marin, Alfalla, 2021; De Miguel, 2015: 162).

Teachers, as the European Union indicated in its Agenda for this level of education, must continue to train and, above all, must commit themselves to continuing to innovate in education. However, it is a matter of going far beyond the mere application of technological tools. In other

words, we must commit ourselves to profound and self-aware proposals to transform the ways of thinking and acting in education, with the aim that students take the leading role in the educational process, that they participate actively and committedly in the development of their learning, and that this learning can and should be applied to solve the real problems facing humanity in each of the areas in which the professions are active.

Students also need to know more about it and experience better this type of educational proposals in order to reduce their resistance to what is presented to them as non-traditional (Córica, 2020). Thus, by designing and establishing scenarios to facilitate overcoming these barriers, students will be more open and interested in participating in active and meaningful educational processes.

In order to address the limitations of the research, in particular the fact that it is an incipient, descriptive and non-generalisable study, it would be useful to answer an initial survey, which would provide clear and precise information about the students' starting situation with respect to questions that were subsequently relevant for the development of this initiative: their willingness to learn by methodologies other than traditional ones, their degree of knowledge and interest in active learning methodologies, their previous experiences in the educational context in relation to active methodologies, their level of knowledge about educational regulations and school organisation based on current legal guidelines. The application of the initial and final surveys must be carried out with all students participating in the project.

With the aim of improving the students' experience and learning, it is also proposed that their educational experience designs be applied in a real group, with the support of the tutor teachers.

All these aspects must be combined with the creation of a committed team of teachers who are actively and proactively involved in its design, implementation, monitoring, and evaluation, so that each member becomes a promoter of the development of competences through the educational experience proposed by the project.

Given the ever-increasing demands of teaching and research work at the University, alternatives and solutions are required to improve coordination among faculty team members, and to facilitate the distribution of tasks to be carried out before, during, and after their execution, so that each person contributes effectively to their design and implementation. Going even further, institutional reorganisation to foster inter-area and inter-departmental communication would also be an element to consider.

In the same way, it would be necessary to encourage the experience of a rotating and shared leadership, which encourages the achievement of the objectives set in accordance with the established time and methods, because according to Trujillo et al. (2020, p. 52), among all the conditioning factors of educational innovation, the definition of a leadership project shared by the whole community and the openness to suggestions from any of its members stand out.

### 6. Acknowledgements

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**European Journal of Contemporary Education**

ELECTRONIC JOURNAL

**Conceptual Bases of Foreign Language Competence Development by Means of Technologies**

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**Abstract**

At each historical stage, in accordance with the requirements that have arisen in society, a new character is given to the essence of Education passed on to future generations, and new positions are considered. Result-oriented education is the formation of competence of the individual. For the training of specialists of higher qualifications, increasing the efficiency and effectiveness of the educational process is of particular importance. In solving this problem, an important role is given to the active work of students in the process of their educational activities.

Currently, education issues are one of the pressing problems of the world community as a whole. The state education program of the Republic of Kazakhstan provides for the issue of ensuring the training of quality specialists by improving education and introducing new information technologies into the educational process.

The purpose of the study is to organize the work of students; first of all, to arrange the work of the teacher in managing the controlled work of students during the practical lessons, undergraduates, and doctoral students. Individualization of training, taking into account the diversity of students' interests, their abilities and scientific and educational experience, equipping them with methods of cognitive activity and a system of orientation in the course being studied. The aim of this research paper is incorporate the theory and practice in foreign language teaching as well as giving practical recommendation in teaching the language.

**Keywords**: development, aspect, foreign language, competence, future specialist, university.

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**1. Introduction**

The importance of the training of future teachers in the system of pedagogical education in higher educational institutions in Kazakhstan, the effective use of digital educational resources is one of the urgent issues.

Training of qualified teachers plays an important role in the field of education.

Today, education is the only way to develop the national consciousness for the growth of the dynamics of social relations, the rapid development of production, the change of the social functions of the school, the formation of the spiritual world, worldview and civic position of young people (Kozhakhmetova et al., 2020).

The problems of improving pedagogical education in universities and improving the quality of teacher training, the role of information and communication tools on the earth and their influence are the main problems of our time, so conducting scientific research requires analyzing their quantitative and qualitative composition (Abulkhanova, 2009).

The expansion of the system of faculties and departments in accordance with the opening of new specialties and the assimilation of practical training are of great importance. If we see that the problem of computer support of the learning process in the methodology of language teaching is mainly developed at the practical level, then research on the problems of using digital technology in educational programs is required. Such a situation indicates that there is a public demand for fundamental researches that consider the success and shadow points in the development of pedagogical education and higher educational institutions in Kazakhstan. In this regard, although the need to study the role of teachers in providing pedagogical education and training personnel from a historical point of view has become one of the actual issues, it has not yet been sufficiently evaluated from a scientific point of view. Therefore, the cognitive-practical, historical-pedagogical and historical-scientific foundations of our research work do not raise doubts about the importance of the work (Yeskermessova, 2020).

Proof of this is the lack of future teachers, which, in our opinion, is an indicator of the crisis situation of school education. The crisis of confidence in the teacher and the school is constantly growing in society, which is reflected in the low attraction of pedagogical professions for school graduates and the decrease in demand for pedagogical professions, in particular, historical professions. This means that "Changing the structure and content of secondary education requires a significant update of the system of teacher training and professional development".

Modern public demand requires the training of today's student, tomorrow's specialist, capable of demonstrating all the true positive qualities of an individual in his work, in interaction with the public. The social essence of a person – his environment, social status, education, the presence of high or low consciousness – are the conditions for the formation of his personal qualities. And socialization is directly linked to education. The types of education are also varied: from birth to old age, the child receives education until the end of his life. Education is twofold: education of younger generations, education of adults, each with its own characteristics.

Therefore, the improvement of the quality of teacher training is carried out on the basis of normative documents that are mandatory for bachelors (teachers) (Abulkhanova, 2009: 14).

Today, with the strengthening of the independence of our young country, with the renewal of the public consciousness, the requirements for the education system, including the study of the country's history, are radically changing. The main task in the study of the history of Kazakhstan is the formation of national spirit and patriotic education in the younger generation.

In the walls of higher educational institutions, educational and educational work has a special place in teaching young students to a profession, in addition to providing pedagogical education and instilling moral qualities in them. Properly organized educational work instills in students the necessary skill and sensitivity for a history teacher, adds to their experience of working with students, and increases their interest and ability in their profession. Therefore, from the first day of the academic year, the educational and educational work given to students admitted to higher educational institutions in order to increase their love for the teaching profession will undoubtedly become more complicated year by year.

Digitization of the educational space in Kazakhstan is considered as a factor of success of students, future teachers, and information and educational technologies. Today, training future teachers to use digital educational resources is the most pressing issue of higher education. They contribute to the effective organization of the educational process in accordance with the requirements of the modern information society, and are becoming a universal tool for the harmonious adaptation of

students to the rapidly changing information society and the preparation of a competent specialist who can realize himself from a professional point of view (Baidenko, 2005).

In this regard, the transition to a new system of result-oriented general secondary education requires a new approach to professional development of teachers in the education management system, and teachers to develop basic professional competencies. Today, one of the main directions of humanization of the educational sphere is the structuring of a planned short-term plan for the purpose of systematic training, the improvement of active forms and methods of training. Formation of a national model of education in the lesson process, displacing the old content. The actual problem that everyone faces is "creating a competitive personality and achieving a productive quality of education using advanced pedagogical experience". In the process of personality formation, the quality of education is given special importance by the school staff. The team, aiming at quality education, seeks to predict and model the capabilities of specialists in advance. After all, they perfectly understand that in order for future specialists to be capable in the educational market, they must comply with the requirements of the internal order. In this regard, in order to ensure widespread access to quality education, the "methodological center" conducts methodological work in several directions. In addition, the school is equipped with audio and video tapes, discs, electronic textbooks necessary for classes on various topics, focusing on the results in achieving the educational goal of the lesson, with special emphasis on the ability of specialists and subject teachers to work with additional educational resources, platforms, electronic textbooks, interactive whiteboards. The teacher of any subject, armed with the necessary materials from the "methodological Center", organizes methodological work to go beyond traditional disciplines and conduct educational work at a high level, focused on the needs of specialists, their specifics, personality (Ananyev, 1999).

New technology is a tool that empowers the teacher, but it cannot replace the teacher.

The following possibilities of using technologies;

– raising the qualifications and retraining of computer science teachers;

– to teach specialists of management of the educational system and subject teachers to be able to freely use new information technology for their services;

– conducting and organizing internships for computer science teachers on important issues of computer science education;

– directing the activities of teachers to distance learning forms;

– leading educational institutions in the region in the scientific-methodical direction.

Among the different directions of new pedagogical technologies, a special place is occupied by a project technology like personal orientation, which implements education through cooperation.

The method of projects is one of the technologies in the field of education based on the creation of social relations in a small group during the study. During the study, students accept and perform various social roles (organizer, leader, executive, etc.) and solve actual problems during real communication, learn and prepare to perform (Abulkhanova, 2002).

The basis of project technology is the orientation towards a specific, clearly defined educational product, which is the end product of project work. Project technology strikes a balance between integration, enablement, and speed and accuracy of speech communication in all areas of foreign language learning (Aigul, Baltabayeva, 2020).

The design technology can accompany any textbook and other educational tools and can be included in the various forms of the general system of the language being learned.

Project technology is very one of the active technologies during teaching and easy to coordinate the activities of creating and managing the development situation, the activities of equal partner relations and the students. The teacher solves the most difficult problems of project technology, such as creating and maintaining motivation, creating a need and interest in project work, "building a bridge" between the learning situation and the actual use of a foreign language (Belyaev, 2016).

## 2. Materials and methods
In the course of the further experiment, the change in the level of formation of students' readiness to use new technologies in professional activity will be monitored under the influence of training.

The motivational component seems very important to us. We are providing the sample of the survey (Table 1) conducted among students. This survey can support the education process during enhancement the competence of the students and can identify the level of competence of being developed.

The question "Are the methods and technologies effective? Do you like them?" only 41 % of respondents expressed their intention to use technologies in their future teaching and research activities, 42 % had difficulty answering and 17 % stated that technologies would be useless to them.

**Table 1.** Sample of survey conducted among students

| 1. | Is professional foreign language education vital for your profession? | a) Yes<br>b) No<br>c) I don't know |
|---|---|---|
| 2. | Does the level of competence play a significant role in the process of your future professional activity? | a) Yes<br>b) No<br>c) I don't know |
| 3. | Does learning professional foreign language improve your career opportunities? | a) Yes<br>b) No<br>c) I don't know |
| 4. | Do you feel comfortable yourself In foreign language classes? | a) Yes<br>b) No<br>c) I don't know |
| 5. | How would you rate your professional foreign language level? | a) I can read and understand the whole idea of what is said, but I hardly communicate.<br>b) I can only read, but I can't speak English well because of my grammar mistakes<br>c) Perfect, I can easily use English in any sphere<br>d) I can use English for solving profession-oriented tasks |
| 6. | Do you often practice professional communication during the class? | a) Yes<br>b) No<br>c) I don't know |
| 7. | What method and technologies are used to train professional communication skills by the teacher in the class? | Free answer: |
| 8. | Are the methods and technologies effective? Do you like them? | a) Yes<br>b) No<br>c) I don't know |
| 9. | Which type of technology help to improve your professional communication skills more? | Free answer: |
| 10 | Do you find hard to remember professional lexis? | a) Yes<br>b) No<br>c) I don't know |

### 3. Results

Today, the university is obliged to form basic competencies such as self-activity, self-responsibility, knowledge skills that determine the quality of modern education in students.

The result of the above-mentioned study showed that the quality of education of students increased due to the proper organization of students' work at the faculty. During the survey conducted among students of various branches of higher education institutions, we noticed a positive dynamic of growth in the effective use of students' work. Interviews were conducted with 80 second- and third-year students. 3 levels of survey results were formulated: low, medium, high

level. Analyzing the obtained data, we can see that 57 %, 63 % of students of the 1st and 2nd years showed a low level, 68 % of students of an average level, 75 % of students showed a high level of 87 % of students. 90 % This allows us to conclude that it is more important for 1st-year students to seek a better education than for 2nd-year students, but we think that from the 4th year onwards, students' attitudes towards their future profession change.



How would you rate your professional foreign language level?
22 responses

- 3,30%
- 8,40%
- 24,20%
- 64,10%

■ Perfect, I can easily use English in any sphere

■ I can use English for solving profession-oriented tasks

■ I can read and understand the whole idea of what is said, but I hardly communicate

■ I can only read, but I can`t speak English well because of my grammar mistakes
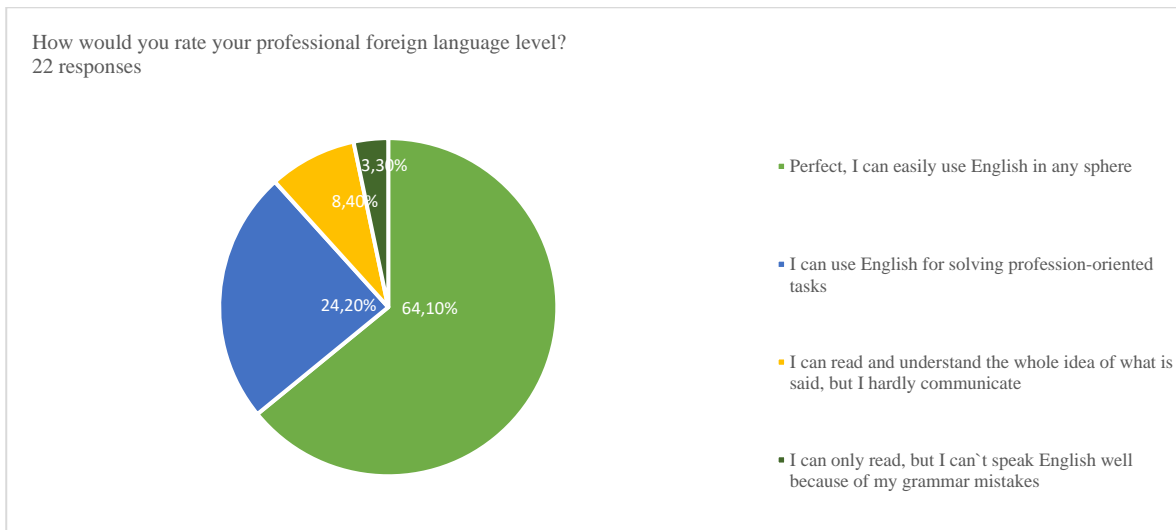
**Fig. 1.** Rating of level

The data of conducted survey illustrates how much the professional language education is important to the specialists. 31,8 % percent of students think that it is very vital to learn the professional language, where 59,1 % of future specialists consider that this is very important. And also it is better to notice that there is a number of people 9,1 % who consider that professional language education is not important.



Is professional foreign language education important for future specialists?

0/22 corrrect responses

| | |
|---|---|
| Vitally important | 9 (31.8%) |
| Very important | 18 (59.1%) |
| Not important | 7 (9.1%) |

0% 20% 40% 60% 80% 100%
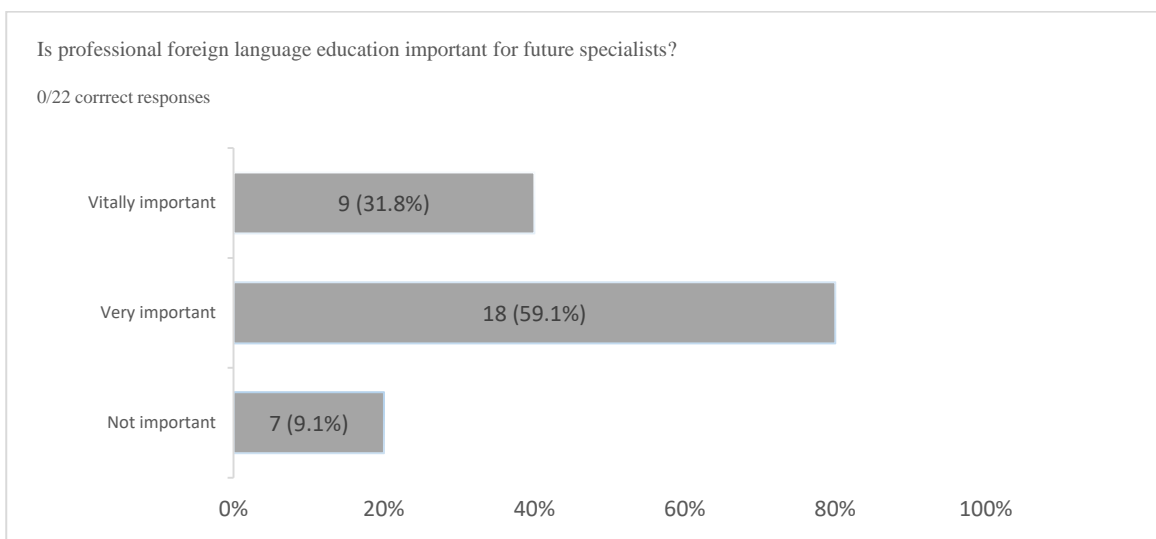
**Fig. 2.** Survey data

During the interview students had to say the most effective type of technology according to their mind and 70 % of them chose case study technology, 18.6 % preferred using game based method and others mentioned problem situations and project method. But, surprisingly, 10 students said that speaking activities and games mostly improve their professional communication skills, whereas almost 17 % of students chose solving problem situations and 5,9 % students chose working with case studies. The data is demonstrated in Figure 3 below.
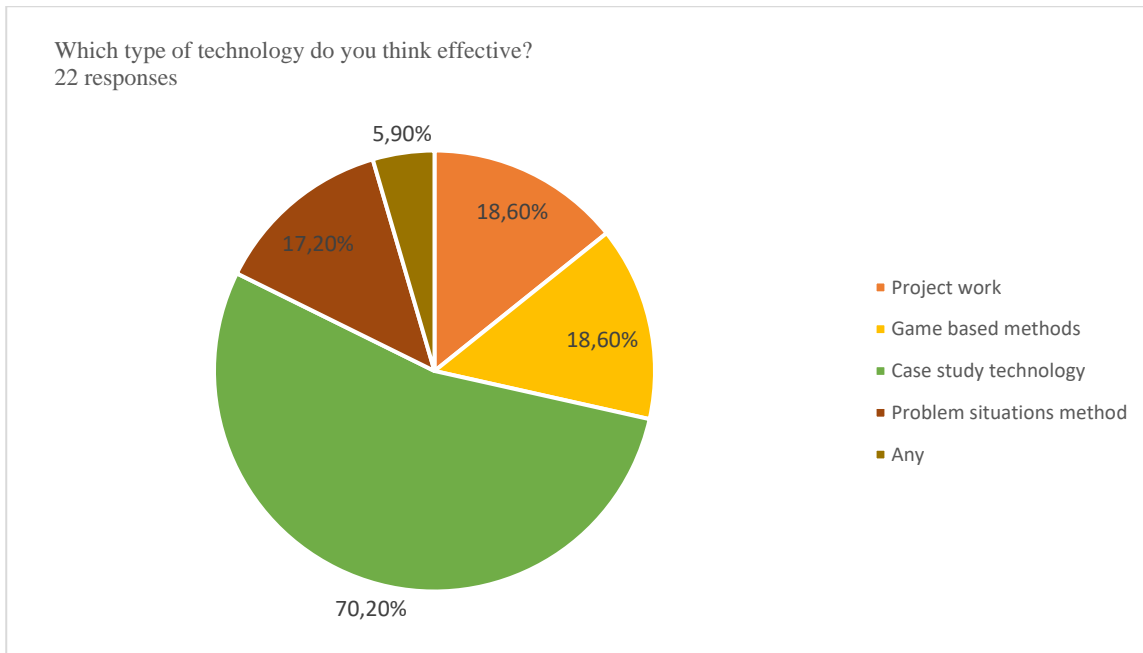
**Fig. 3.** Technologies applied in teaching

Finally, for the question to what extent, case studies are helpful, and which technology is considered more effective? We had following answer that 9 students, that is 50.8 % answered positively about this technology about case study. And also 13 people say that speaking activities are very helpful in language study. The whole results of the interview are presented on the following Figure 4:
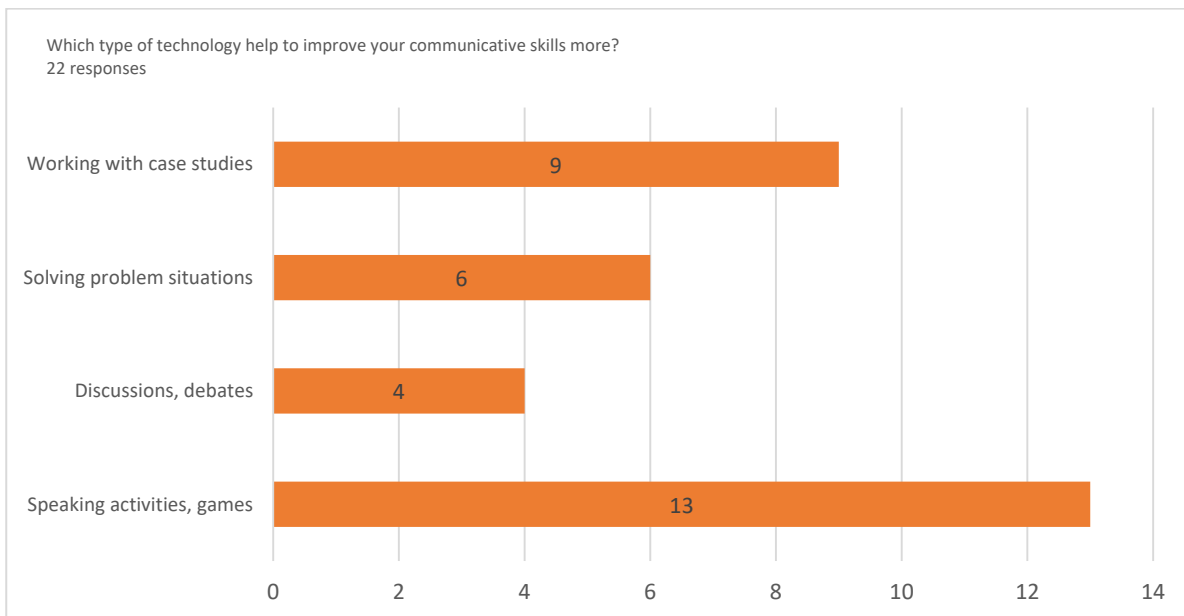


**Fig. 4.** Analysis of the effective technologies

### 4. Discussion

We analyze the importance of organizing students' own work. After all, it increases the independence of students' actions. The student's independent work is the study of any subject aimed at forming the student's scientific and educational professional activity, making optimal decisions for solving, regardless of the fact that this work is aimed at developing a methodology for performing independent work. issues are independent. , and getting out of crisis situations. After

all, this work not only allows the student to conduct his own work in education, but also to train a modern highly professional specialist.

Competence is the result of education reflected in the quality of the student's actions (Amitrova, 2011).

The main goal of competence is to help the students adapt to social society and lead an active life. This goal can be achieved only by fulfilling several conditions:

By analyzing reading and listening texts, students will acquire the competence mentioned in situations of making moral choices, participating in human conversation. For example, first year students task on the topic "TV in our life": You are a member of a discussion group connected with a TV program on the topic "Violence on TV". State your point of view on this issue (Baskaev, 2019).

First year student on the topic "Island problem" students asked "What would you do if you had to create a project aimed at solving the island problem?" What ways would you find to solve this problem? will conduct a discussion around the questions.

In the course of pedagogical practice, individual characteristics of students, their abilities and inclinations are taken into account. In order for the educational result to be truly high-quality, the student must move along a personal learning trajectory. Sometimes a student who has studied and learned English in school may come to the university who has not studied English at all. Such a student needs to study on a personal educational trajectory in order to "catch up" with other classmates in a short period of time. Some students, on the other hand, whose interests go beyond the program material in terms of vocabulary and grammar, and who are also interested in the history of the country, should be developed by the teacher in his own learning trajectory (Alabugina i dr., 2008).

Mastering the general cultural competence allows to join the intercultural dialogue, the need of which is increasing year by year, to be tolerant. The following tasks can be specified as typical:

Topic "Holidays". The importance of a modern approach to age-old traditional holidays. Task: Read the interview between Roy (a rock musician) and Lydia (a punk poet) and guess the answers of each from the jumbled lines. What are their views on traditional holidays? And what about you?

The role of group work should also be noted. Students engage in discussions on various topics and search a lot to prove their ideas, and this search is enabled by information technology (Arkhipova, 2006).

The results of the experiment confirmed that it is necessary to first determine the amount of knowledge and ideas. They should be chosen taking into account the cognitive and age characteristics of students. It is necessary to isolate the main features of the concepts and facts formed in each lesson, to generalize them, to develop them consistently and purposefully, as well as to use effective teaching tools and methods (Mukhametkaliyeva et al., 2022).

A positive result was obtained, which contributed to the increase of interest in the introduction of developments and practical recommendations (Atabekova, 2009).

He can communicate with the people around him, ask the right questions and enter into a dialogue;

Master various language activities, linguistic and linguistic competence, such as monologue, dialogue, reading, writing. Possesses positive communication skills in a multinational, multi-professional environment (Berdashkevich, 2018). During the training process, I create conditions for the formation of basic competencies in students:

## 5. Conclusion

To sum up, the changes in the development of modern society, economy and education require the formation of a person of the XXI century who can distinguish any situation, actively participate in cultural and social events, and make decisions on his own in the changing times. That's why the writer Clark said, "It is necessary not only to know, but to use it. The words "not only wish hard, but act" are relevant today.

"Due to globalization and modernization, the world is changing rapidly, which causes great problems for people and society. Schools must prepare students to live and work in a world that forces them to work with people from diverse backgrounds, to consider different ideas, perspectives, and values. Schools in the twenty-first century must help students develop independence and individuality that understands the reality of national and global pluralism, preparing them to join others in life, work, and citizenship" (Baidenko, 2009).

Using modern technologies helps students to improve their speaking, listening, reading and writing skills. As these skills improve over the course of the study, students become confident in using acquired knowledge in an integrated way to evaluate information, present and formulate arguments, and construct detailed explanations relevant to a specific task, a specific audience, and a specific purpose. Students gain knowledge that enables them to apply the skills they have acquired in any situation, helping students to use any oral and written texts critically and confidently, to speak thoughtfully and clearly, to communicate with each other and to apply skills skillfully to a wide range of tasks (Andreev, 2005).

## 6. Acknowledgements

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# Development of a Cognitive Map of Youth Social Competencies

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**Abstract**

The modern professional attaches great importance to the development of social skills, such as the ability to communicate effectively, work in a team, empathy and conflict management. Without the skills of interpersonal interaction, self-regulation and self-development, as well as a formed core of values that allows one to navigate a rapidly changing world, no individual can be a sought-after employee or an effective entrepreneur or manager. This fact determines that in the modern education system, including higher professional education, a competency-based approach is used. At the state level, a system has been created that ensures the formation of social competencies of young people. Thus, the competency-based approach is reflected both in federal educational standards and in numerous studies in the field of education and human resource management in business. As a result, science and practice have already accumulated some experience in understanding social competencies in the context of their formation and development. At the same time, modeling social competencies is an important scientific task from the point of view of determining the results of educational activities and assessing its quality. The authors of this study set a goal to develop a cognitive map of social competencies of young people based on studying the genesis of the competency-based approach and the conceptualization of social competencies in higher professional education.

The study showed that the competency-based approach has existed for many years in many countries and is an objective necessity in the formation of young specialists. Based on the analysis of various approaches to the interpretation of "social competencies", using tools such as content analysis, tag cloud and cognitive map, the authors built their own model of social competencies. The results obtained can be used by educational organizations both to formulate the results of mastering educational programs and for their further evaluation. Also, the results obtained can be useful to a wide range of practitioners: teachers, specialists in corporate training and personnel selection, as well as managers in the education system.

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**1. Introduction**

Traditionally, the competency-based approach in Russian education is associated with entry into the "Bologna Process" – a system aimed at unifying European education, as a result of which mutual recognition of higher education diplomas would be achieved. For two decades, the Russian Federation adhered to the principles of the Bologna process and rebuilt its traditional education system in the 20th century to European standards. At the beginning of 2023, a decision was made to initiate the reverse process (Poslanie Prezidenta...). Does this mean that the word competence will disappear from the Russian educational space?

Let us turn to the history of the origin of this term. The first mentions of competencies and their management go back to ancient times. For example, the outstanding work "Artshastra", written by the prime minister of the great Indian Emperor Chandragupta Maurya, more than 3000 years ago and representing one of the greatest works of mankind, covering the fundamentals and practical applications of many fields of knowledge, including human resource management (Warier, 2014).

According to the large encyclopedic dictionary, competence (from the Latin compete – jointly achieve, achieve, comply, approach) is knowledge, experience in a particular field (Bol'shoj enciklopedicheskij...).

The term "competence" was first used by R. White in 1959 to describe personality traits that ensure excellent performance of any work (Rol' kompetencij..., 2013). Also, the famous American linguist N. Chomsky used the word competence to denote the knowledge of language by the speaker or listener (Homskij, 1972).

Then more and more works appeared devoted to competencies and competence in education, not only in the linguistic environment. Experts traditionally distinguish three stages in the development of a competent approach to education:

1) 1960–1970, when the concepts of competence and competencies were introduced into scientific circulation and the prerequisites were created for their differentiation. N. Chomsky introduces the concept of "communicative competence";

2) 1970–1990 – the terms competence and competencies become generally accepted in the theory and practice of language learning, and the concept of "social competence/competency" appears;

3) From 1999 to the present – the Bologna process, within the framework of which uniform requirements for competencies are being developed as a result of mastering educational programs at various levels of professional education.

Should we believe that the word competency is alien to Russian education and is only the result of joining the Bologna process? The analysis of the archival Federal State Educational Standards approved by the State Committee of the Russian Federation for Higher Education (Goskomvuz) in 1993–1996 (Arhiv standartov GOS VPO) indicates that the words "competence" and "competency" are not really presented in them, but there is a subsection 2.1 "General requirements for education specialist" and subsequent subsections describing the requirements for theoretical and practical knowledge, as well as professional and supra-professional skills, which are determined, among other things, by the category of "ability", as well as competencies in the latest educational standards of Russia of the 21st century.

Thus, we can conclude that the term competency is not an innovation of the Bologna process, but an objectively formed approach in education that describes an individual's ability to carry out certain types of professional activities. Moreover, this approach was formed both in foreign countries and in Russia. For example, in the State educational standard for higher education in the major 061100 "Management", approved on 02/03/1996, there is the following requirement for a specialist: "capable of project activities in the professional field, knows the principles of systems analysis, knows how to build and use models for description and forecasting various phenomena, carry out their qualitative and quantitative analysis."

And yet, why did it become necessary to abandon traditional KAS (ZUN in Russian): "knowledge", "abilities" and "skills", and turn to competencies? The answer to this question lies in the area of the social and economic changes that are taking place in society, namely: the gradual complication of the labor market, the emergence of new professions that impose specific qualification requirements, leading to the emergence of such concepts as supra-professional

knowledge and metaskills, as well as the strengthening role of cognitive and information and communication skills that help a specialist in any field adapt to a rapidly changing world. New economic and social realities have led to the formation of new requirements for graduates of higher educational institutions, expressed in the presence of systemic, analytical, creative, cognitive, self-organizing, communicative and moral principles in the personality of a professional.

Undoubtedly, globalization and the resulting desire for unification spurred the development of a competency-based approach in education, giving rise to the Bologna process. A UNESCO report from 1997 places great emphasis on such important characteristics of graduates as the ability to work in a team, initiative, the ability to communicate and express oneself in various ways, as well as the ability to understand cultural differences, etc. (Doklad mezhdunarodnoj..., 1997).

A good example of the implementation of the Bologna process is the Tuning program (TUNING Educational Structures in Europe), developed under the supervision of the universities of Deusto from Spain and Groningen from the Netherlands for the implementation of the large-scale Socrates-Erasmus project of the European Commission. Representatives of more than 100 universities from 16 countries worked on the program, as a result of which core competencies were formulated as the results of educational programs, serving as an effective tool for selecting methodological material and drawing up curricula and programs. According to the tuning system, a graduate must have instrumental, interpersonal and systemic competencies.

In the context of this research, interpersonal skills are a key focus, as outlined in the Tuning program. These skills include:
– Capacity for self-evaluation and constructive criticism;
– Collaboration within a team setting;
– Strong interpersonal communication abilities;
– Proficiency in interdisciplinary teamwork;
– Effective communication with specialists from various disciplines;
– Understanding and appreciation of diversity and intercultural nuances;
– Adaptability to working in an international setting;
– Dedication to upholding ethical standards.

Thus, in general, the competency-based approach is a concept used in professional education and development to determine its goals and content, as well as to evaluate the results of the educational process, select the best for a vacant position, etc. And competencies and competence themselves require the integration of many disciplines, that is, they are a product of interdisciplinarity in the training and development of professionals.

In order for the competency-based approach to most fully realize its objectives in the field of youth development in educational organizations, it is advisable to conduct a study of various approaches to understanding social competencies and carry out modeling of social competencies using various tools, including cognitive maps. It is important to note that although there is currently a large amount of research on the social competencies of young people, there is no tool that would allow them to be modeled in the form of specific results of educational activities and personality development. This is precisely what this work aims to achieve.

**2. Materials and methods**

To achieve the set scientific aim, the authors analyzed various sources on competencies, including social competencies. The study used methods such as semantic analysis, content analysis, tag cloud construction and cognitive map development. The methodological basis of the study was scientific publications on the competency-based approach in education and human resource management.

It should be noted that often in a professional environment you can hear two concepts: "competence" and "competency". In order to prevent the merging of two terms, it is worth drawing a line between them. A.V. Khutorskoy does it as follows:

Competency refers to a combination of interconnected personal traits (knowledge, skills, abilities, and methods of operation) tailored to a particular set of tasks and processes, essential for performing high-quality work in relation to them.

Competence involves an individual's acquisition of the necessary skills, along with their personal attitude towards these skills and the specific subject matter (Hutorskoj, 2017).

It is important to emphasize that the concept of competence is a property not only of pedagogy and the field of education. Currently, in management and the theory and practice of

human resource management in an organization, a competency-based approach is also used, which consists of drawing up competency models for a specific organization, identifying general and specific competencies, as well as general corporate, managerial, professional and many other types. There are different approaches to understanding management competencies, the most common being European and American (Table 1).

**Table 1.** Comparison of American and European approaches to the study of competencies

| Comparison criterion | American | European |
|---|---|---|
| Conceptual approach | Description of employee behavior | Description of job tasks or expected results |
| Concept of competency | Competence is a fundamental attribute of an employee, enabling them to exhibit appropriate behavior and attain exceptional results in the workplace | Competency is the ability of an employee to act in accordance with the standards accepted in the organization |
| Important aspects | Individual characteristics manifested in behavior: personal characteristics, motives, values, habits, self-image, knowledge, skills, abilities. | "Iceberg of competencies": cognitive competencies – functional competencies – personal competencies – ethical competencies – meta-competencies |
| The essence of the approach | Determine what an employee should do to achieve peak performance | Set a minimum standard that must be achieved by an employee |

Source: compiled by the authors

In addition, specialists in the field of business, management and human resource management traditionally highlight the competencies of the organization as its key factors of competitiveness, the competencies of the employee (staff), as well as the competencies of the position, that is, a description of the requirements for the level of competencies that a specialist must have this position (Figure 1).

| competencies of an organization | competencies of an employee (staff) | competencies of a position |
|---|---|---|
| • general (key) • specific | • corporate • personal: managerial and professional | • corporate • personal • professional |

**Fig. 1.** Types of competencies in management theory and practice
Source: compiled by the authors

In order for organizations to multiply and demonstrate their key competencies at a high level, they need highly professional personnel, that is, hired workers who, in turn, have competencies of the appropriate quality. All this leads to the fact that the competency-based approach in education and management should be closely linked. The competencies included in the educational standards of vocational education must be agreed upon with potential employers of graduates, which is currently happening. For example, the Financial University implements all its educational programs and coordinates them with leading employer organizations (Oficial'nyj sajt...). This is necessary in order to ensure compliance between the competencies of the position in the organization and those competencies that the graduate will have upon completion of a particular educational program.

At the same time, much in organizing teaching using a competency-based approach depends on the educational organizations themselves, because they are responsible for training future professionals

and developing the potential of the country's youth. For example, according to a number of regulations of the Ministry of Education and the Ministry of Science and Higher Education of the Russian Federation, competencies are defined for each level of the educational process.

Let us look at the list of competencies that schoolchildren, students and university graduates need to master (Figure 2).

| Competencies for schoolchildren | Competencies for students | Competencies for graduates |
|---|---|---|
| • Able to independently acquire knowledge<br>• Apply knowledge in practice to solve a variety of problems<br>• Work with various information<br>• Think independently and critically<br>• Flexibly adapt to changing living conditions<br>• Self-discipline<br>• Knowledge about ensuring life safety (life safety)<br>• Ability to work together | • Search, critical analysis and synthesis of information<br>• Development and implementation of projects, the ability to identify tasks within the framework of the set goal<br>• Analyze, summarize and argue obtained and available information<br>• Initiative and leadership<br>• Ability to communicate and intercultural interaction and adaptation<br>• Self-organization and self-development<br>• Ensuring and observing life safety (life safety)<br>• Teamwork (ability to interact socially) | • Competent to work with information<br>• Creative application of existing knowledge, skills and experience<br>• High professionalism<br>• Systematic, logical, critical thinking<br>• High flexibility and ability to adapt in a short time; stress resistance<br>• Self-perfection<br>• Following the norms and rules of life safety, their compliance and ensuring implementation<br>• Teamwork ("team player") |

**Fig. 2.** List of competencies for schoolchildren, students and graduates
Source: compiled by the authors

As discussed earlier, the competency-based approach to education and human resource management was a response to unprecedented global changes in the world in general, and in the economy in particular. Globalization, computerization and further digitalization, the incredibly fast pace of scientific discoveries and their implementation in practical life and production necessitate the training of highly qualified specialists who can quickly adapt to changes, work in a multicultural environment, and constantly develop and improve their skills. All these requirements are reflected in the concept of "social competencies". As noted by Yu.V. Kopytova, recently there has been an acceleration in the pace of development of this issue in the specialized and scientific literature, many publications on the topic have appeared, which is due to the actualization of the need for social competencies for the reasons described earlier (Kopytova, 2018).

As previous studies have shown, to date, a unified understanding of social competencies has not been formed in the scientific community. Some experts define social competencies through the success of an individual in society, others through the ability to interact with people around them, and still others through the skills of solving various social problems (Belyaeva, 2005). Social competencies can be defined through the specific skills that an individual possesses, through the social status that he has achieved at a certain point in his life, through his relationships with loved ones, colleagues, partners, etc., as the ability to behave in accordance with the context of the situation, as personal effectiveness and achievement of set goals. All this indicates a wide variety of social competencies, since each of these points of view is fair in its own way.

It becomes obvious that social competence is inextricably linked with social interaction and the individual's manifestation in society. In essence, it is a whole body of knowledge and practical skills necessary to achieve individual goals. On the main functions of social competencies T.B. Belyaeva refers:

1. Social orientation can be understood in three ways, including situational, retrospective and prospective social orientation. The first, includes individual's awareness of his own social status in the current moment; the second, is a representation of knowledge of the origin of current social status, and the third, is a vision of his future social status and a plan for achieving it.

2. Adaptation, expressed in the ability to adapt to constantly changing social conditions.

3. Integration, ensuring the inclusion of the experience of an individual, a collective, a people into its self-awareness (Belyaeva, 2005).

Traditionally, experts distinguish a three-level structure of social competencies:

1) Emotional-value core as a set of attitudes, values, relations, etc.;

2) Cognitive abilities, predetermined by the value core, on the basis of which the individual selects information and assimilates it (cognitive substructure);

3) Behavior, depending on the first two levels, on the basis of which the individual interprets the information received and reacts to it accordingly. It is the third level that can be called superficial, that is, the visible social environment (operational substructure).

Differences in the understanding of social competencies also determine differences in the interpretation of their structure. Thus, M. Argyle believes that social competence includes the following four main components:

1) Social sensitivity – accuracy in understanding another person;

2) Key abilities of interpersonal interaction;

3) The ability to show social approval and reward;

4) Presence of balance and calmness (Argyle, 1994).

In turn, V.N. Kunitsyna, N.V. Kazarinova, V.M. Pogolsha social competencies multi-component (operational, verbal, socio-psychological, ego-competence), which involve the development of the ability to express one's thoughts orally and in writing, have a minimal understanding of the structure and functioning of society, its traditions, values, customs, social roles structure, acceptance of diversity and knowing of methods of conflict resolution as well as awareness of one's personal characteristics, characteristics and traits, advantages and disadvantages, reasons for success and failure, possession of self-organization and self-regulation skills (Kunicyna, et al., 2003).

Krasnokutskaya S.N. defines "social competence" through the process of integrating an individual into the social system, entering the social environment through mastering its social norms, rules and values, knowledge, skills, habits that allow him to function successfully in society, that is, the process of socialization. This is reflected in the performance of such functions as being a family man, a professional and a citizen in all their complexity and diversity. That is, a person, in the process of his formation and development, must learn to cooperate, build contacts, be flexible and responsible (Krasnokutskaya, 2006). In the approach of this specialist, it is important to note the versatility of the individual's social roles, the successful development of which in the process of life is achieved through mastering a wide range of social competencies.

According to E.A. Priborovich, the most important component of social competencies are health-saving and health-creating skills (Priborovich, 2017). Of course, a person will not be able to realize the fullness of his social roles and reveal his full potential if he cannot count on his good physical health, which largely depends on his own knowledge, skills, abilities and habits. These elements, undoubtedly, should be reflected in the modern map of social competencies of young people, since the development of potential cannot be achieved without a strong foundation of physical health. A generally recognized specialist in the field of competence I.A. Zimnyaya identifies the following parameters of social and personal competence: normative ideals and personal values, creative activity, tendencies towards favorable cooperative relationships, openness to experience, communicative competence, activity, responsibility, conscientiousness and the ability for self-regulation (Zimnyaya, 2004).

V.Sh. Gabozova, N.I. Malyuk understand social competencies through the criteria of social success: economic independence, adaptability, social responsibility, citizenship and activity, self-organization, the achievement of which is not possible without cultural development based on the values of humanism (Gabozova, Malyuk, 2016).

According to T. Abdulazimova social competence of students is a certain level (low, basic or advanced) of development of an individual, at which he understands his place in society, successfully interacts with it, accepts his citizenship, maintains health and masters ICT technologies at the student level (Abdulazimova, 2019).

Achieving a high level of social competence involves various aspects such as the ability to communicate effectively, work in groups, make responsible decisions, understand one's own goals and needs, as well as the ability to find one's role in society, resolve conflicts, and self-regulate. (Alekseeva i dr., 2017).

Age characteristics cannot be ignored. Thus, young people, compared to older generations, cope worse with life problems; sometimes they lack not only responsibility for their actions and the ability to self-organization and self-discipline, but also the analytical abilities to adequately assess what is happening.

That is, the question arises about certain personal characteristics in the area of self-determination, self-actualization, and generally understanding one's own purpose. Globally, this matters not only for their professional activities, but also for their overall success in life. This also includes achievement motivation, teamwork skills, the ability to negotiate, adaptability and curiosity (Povov, 2020). Social and personal competencies I.V. Plaskina, K.V. Drozd, A.V. Zobkov are considered as a complex systemic formation, as a set of competencies that relate to the person himself as an individual and contribute to successful interaction with other people and society, self-development and self-realization (Plaksina i dr., 2011).

The ability to cooperate as one of the important social competencies can be considered in the context of its three-component structure: knowledge, skills and relationships to achieve common goals (Parygina, 2020). When entering educational institutions, people inevitably interact with other members of society. However, certain conditions are necessary for the successful development of collaboration skills:

– social (adaptation to the socio-cultural environment, interaction with people of different ages, encouragement of teamwork);

– psychological and pedagogical (support and guidance in socio-cultural activities, encouragement of initiative);

– organizational and subject-related (creating a convenient and stimulating environment, developed infrastructure) (Rusakova, 2021).

As noted by T.P. Grass, V.I. Petrishchev, Y.A. Romanyuk based on their study of the experience of socialization of students in US schools, the social competencies of schoolchildren are formed under the influence of economic adaptation. The practical significance of social competencies is revealed in American schools through economic activity and the assimilation of market relations: students learn to formulate and implement their business ideas already in high school (Grass, et al., 2018).

Thus, an analysis of an extensive number of sources on the study of social competencies of young people in Russia and abroad indicates that social competencies are a complex multicomponent phenomenon that ensures individuals success in the modern world. To specify social competencies in order to formulate the results of youth development, it is advisable to carry out their modeling, for which the tool of cognitive maps will be used, as well as content analysis and the construction of a tag cloud using specialized online services.

During the content analysis, key semantic units will be identified from the sources analyzed above, dedicated specifically to social competencies (Abdulazimova, 2019; Alekseeva i dr., 2017; Argyle, 1994; Belyaeva, 2005; Gabozova, Malyuk, 2016; Grass, et al., 2018; Zimnyaya, 2004; Krasnokutskaya, 2006; Kunicyna, et al., 2003; Plaksina i dr., 2011; Povov, 2020; Priborovich, 2017; Rusakova, 2021).

### 3. Results

A cognitive map is a method of understanding phenomena by modeling the relationships between objects. The term was first introduced in 1948 by E.C. Tolman to designate the structure of the surrounding reality formed in the brain as a result of cognition (Tolmen, 1980). Subsequently, American political scientist and economist Robert Axelrod described the use of cognitive maps for making management decisions under conditions of uncertainty (Axelrod, 1976).

Currently, cognitive maps have found wide application in psychology, management and business, project management, marketing, engineering and software development, etc. In general, a cognitive map is a graph whose nodes are concepts, and the connecting lines are relationships between concepts that explain the relationships between them.

At the first stage of developing a cognitive map of social competencies, it is important to identify the concepts that will be involved in the vertices of the graph. To do this, we will conduct a content analysis of various sources on the issue of social competencies. All sources were discussed in the previous subsection of the article. From them, fragments were isolated containing the structure and description of social competencies from the point of view of various researchers and specialists. A tag cloud was compiled from available sources using the online service, Figure 3

(Servis dlya…, 2023). A tag cloud is a way to visualize text with the most frequently occurring words appearing larger than less frequently occurring words.



**Fig. 3.** Tag cloud about social competencies
Source: compiled by the authors using the world's cloud service

As can be seen from Figure 2, the most frequently occurring words in sources about social competencies, in addition to repeating the stimulus word itself (social and competence), are the following: emotions, responsibility, empathy, team, to adapt, communication, understanding, knowledge, skill, behavior, feelings, goals, behavior of others, etc. (the conclusion was made taking into account different endings of the same words). That is, social competencies are about interacting with other people to achieve certain goals, taking into account emotions and feelings, as well as the manifestation of empathy and cognitive abilities.

This is also confirmed by content analysis conducted using the Advego online service (Semanticheskij analiz…, 2023). The semantic core of all sources on social competencies is presented in Table 2.

**Table 2.** Semantic core of social competencies

| Phrase/word | N | Frequency, % |
|---|---|---|
| **social** | 43 | 2.74 |
| knowledge | 24 | 1.53 |
| ability | 21 | 1.34 |
| competence | 20 | 1.28 |
| **emotion** | 20 | 1.28 |
| ability | 18 | 1.15 |
| skill | 13 | 0.83 |
| **attitude** | 9 | 0.57 |

| Phrase/word | N | Frequency, % |
|---|---|---|
| **value** | 9 | 0.57 |
| **individual** | 8 | 0.51 |
| competence | 8 | 0.51 |
| **solution** | 8 | 0.51 |
| **feeling** | 8 | 0.51 |
| **achievement** | 7 | 0.45 |
| **behavior** | 7 | 0.45 |
| **system** | 7 | 0.45 |
| **information** | 6 | 0.38 |
| **norm** | 6 | 0.38 |
| **responsibility** | 6 | 0.38 |
| **understanding** | 6 | 0.38 |
| **acceptance** | 6 | 0.38 |
| work | 6 | 0.38 |
| situation | 6 | 0.38 |
| own | 6 | 0.38 |
| social competence | 6 | 0.38/0.77 |
| **interaction** | 5 | 0.32 |
| **choice** | 5 | 0.32 |
| **communicative** | 5 | 0.32 |
| thought | 5 | 0.32 |
| image | 5 | 0.32 |
| **awareness** | 5 | 0.32 |
| understand | 5 | 0.32 |
| **development** | 5 | 0.32 |
| **emotional** | 5 | 0.32 |
| **adapt** | 4 | 0.26 |
| **group** | 4 | 0.26 |
| desired | 4 | 0.26 |
| **knowledge of the market system** | 4 | 0.26/0.77 |
| **team** | 4 | 0.26 |
| **conflict** | 4 | 0.26 |
| **personality** | 4 | 0.26 |
| **motivation** | 4 | 0.26 |
| **society** | 4 | 0.26 |
| **job** | 4 | 0.26 |
| **self-regulation** | 4 | 0.26 |

Source: compiled by the authors using the Advego service.

Those semantic units that will be used in the future when drawing up a cognitive map of social competencies are highlighted in bold in Table 2. Out of the 45 most frequently occurring words, we selected exactly those words that designate or are related to the designation of certain facets of social competence. That is, words such as skill, ability and actually social, competence, competencies, etc. were excluded. Verbs that denote actions that we have already chosen, for example, understand/understanding, were also excluded. We used the word "own" in the variant of the prefix "self-", but we did not use the words "image", "thought" and "situation", since they are more contextual than meaning-forming. We did not use the word "desired", since we mean that individuals a priori act based on their desires and aspirations.

### 4. Discussion
The obtained and described results (semantic units), which are presented in Table 2, will be used to designate the vertices of the cognitive map graph. In turn, the relationships between the

vertices of the graph will be predetermined according to what was described by T.V. Belyaeva model of social competence, consisting of three levels: the value core, cognitive and behavioral aspects (Figure 4).

The value core is a set of moral and ethical norms, beliefs and values, as well as motivational attitudes, among which one can highlight humanism, patriotism, tolerance, respect for oneself and others, intelligence, the desire to change the world for the better, etc. It is in the process of educating an individual that the value core of his life is formed, including social competencies. Based on this value-semantic core, the individual forms ideas (mental representations) about himself, other people, society, economics, politics and his profession. All these ideas are closely interconnected, as shown in the figure by bidirectional arrows. These ideas, or representations, that is, the cognitive aspect of competencies, in turn, predetermine the behavior of the individual: those specific actions that the individual performs in the process of his life, social interaction, development and professional self-realization.

Thus, the study of existing concepts in the competency-based approach in education and human resource management made it possible to identify existing approaches to understanding competencies and, in particular, social competencies, which are expressed in effective interaction and achievement of goals by an individual in various spheres of public life. Using content analysis tools, the key components of social competencies were identified, which were later used in the development of the author's cognitive map of social competencies. The compiled map can be used in the development of educational standards and programs, as well as to assess the level of development of social competencies among young people in order to draw up a further trajectory for the development of youth potential in an educational organization, region, or country as a whole.



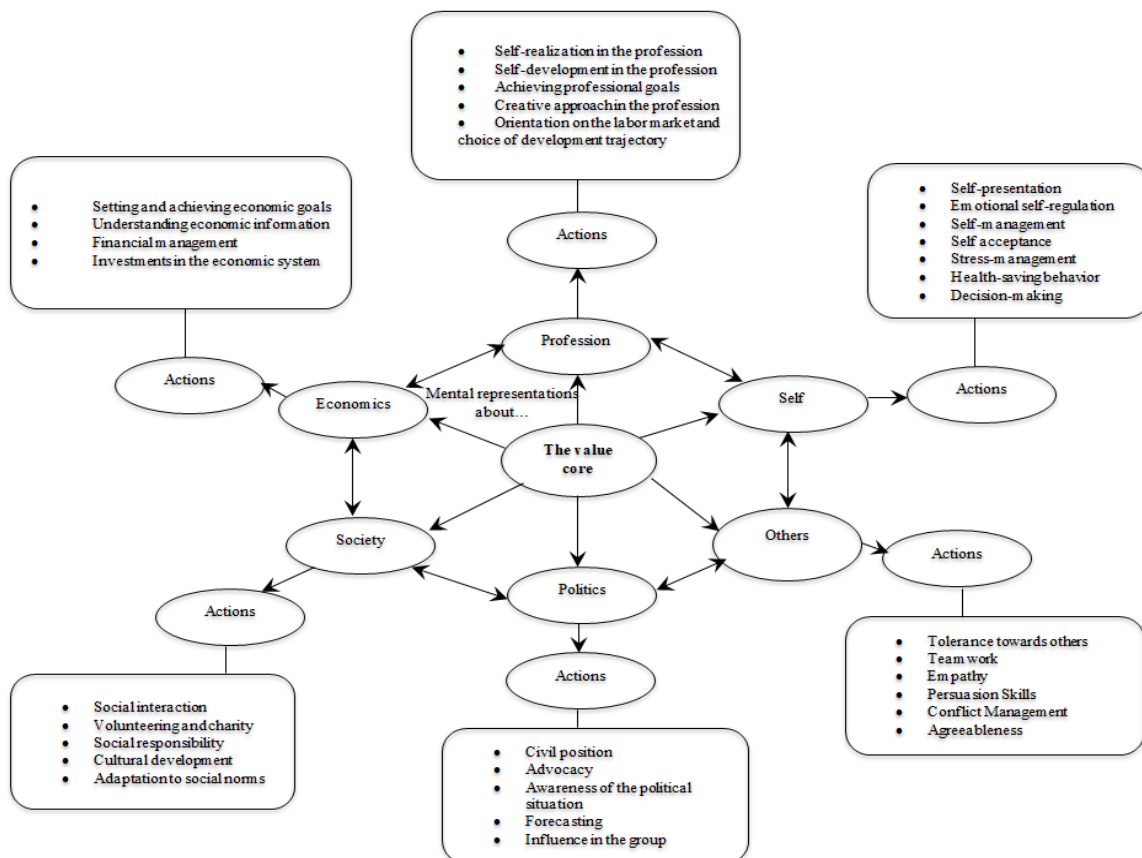**Fig. 4.** Proposed cognitive map of youth social competencies
Source: compiled by the authors

### 5. Conclusion

Social competencies are the most important element in the development and education of young people, since without them, effective interaction between individual members of society is unlikely and, as a result, it is impossible to ensure the progressive development of society as a

whole. Each individual, in order to achieve personal goals, must, to one degree or another, possess a wide range of social competencies that are formed throughout life, but the foundation, of course, is laid at the stage of growing up in the family and educational organizations.

As a result of the study, the main trends in the development of a competent approach in Russia and abroad in education and human resource management were identified, and various approaches to understanding social competencies and emotional intelligence as one of the key components of social competencies were identified. All this made it possible to form a conceptual pool of categories from which a cognitive map of social competencies was subsequently modeled.

As a result of the use of content analysis, the most frequently occurring semantic units in descriptions of the social competencies of young people were obtained. Next, all these semantic units were analyzed and selected to compile a cognitive map of social competencies.

The resulting cognitive map of social competencies can be used to develop educational standards and individual academic disciplines and curricula, as well as to assess the development results of young people during training in a particular educational organization.

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# Perception of the Flipped Classroom Model by Students in the Process of Studying Humanities Disciplines

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**Abstract**
The improvement of the educational process requires continuous monitoring students' perception of the method of training, determining the factors affecting their satisfaction, and ensuring their positive attitude to learning. The study aims to assess the level of satisfaction of future specialists with the flipped classroom blended learning model implemented in their learning process. The participants were 104 second-year students from various humanities disciplines at a university in Moscow, Russia. The study employed a pedagogical quasi-experiment and a survey as primary research methods. The quasi-experiment was conducted over the second semester of the 2022–2023 academic year, during which the flipped classroom blended learning model was implemented. The survey included questions on various aspects of satisfaction and efficiency of learning, with responses given on a 5-point Likert scale. Based on a theoretical analysis, factors influencing student satisfaction with blended learning and conditions for its effective deployment were established and utilized in introducing the flipped classroom model into specialist training. A survey showed that over two-thirds of the students are satisfied with the flipped classroom model. Furthermore, most students give a positive assessment of the outcomes of their professional development (theoretical knowledge, new practical skills, intention to apply the obtained results in future professional practice, and opportunities for improving the quality of future professional work). A positive correlation is discovered between students' satisfaction and self-assessed learning outcomes. Moreover, student satisfaction is found to positively correlate with academic performance. The obtained findings give reason to recommend the flipped classroom blended learning model to be introduced into the process of specialist training based on the proposed structure.

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**Keywords:** blended learning, flipped classroom, assessment system, satisfaction with learning, learning success.

### 1. Introduction

The contemporary educational environment is undergoing major innovations, which brings to the fore students' perception of the learning process (Avdeeva et al., 2022; Gadzaova et al., 2023; Golubeva et al., 2023). In this context, ensuring that students have a positive perspective on the method of their training becomes a significant and topical pedagogical problem, as it can improve not only the overall educational atmosphere and motivation but also learning outcomes (Belous et al., 2021; Vdovina et al., 2021). The explosive development of information technology has boosted the popularity of distance learning methods and blended learning models in the system of vocational training of specialists (Nikolaeva et al., 2023; Yumashev et al., 2021).

However, the attitude of students to such methods is ambiguous. In a study by N.Z. Martinjak (2023), part of the students deemed the efficiency of their training to decrease after the introduction of distance learning. Students' motivation and attendance were found to decrease, their learning activities and training methods had become less diverse, independent work no longer satisfied them, and learning became insufficiently problem-based (Korotaeva, Kapustina, 2022; Uralbaeva et al., 2023). Data indicating that students are not sufficiently engaged and drop out of distance learning point to an additional indirect factor in their lack of satisfaction with learning based on information technology (Akhmetshin et al., 2021; Goyushova, Kapustina, 2022; Rabadanova et al., 2022).

A systematic review by A. Atmacasoy and M. Aksu (2018) presents conflicting results, noting that some studies demonstrate positive attitudes to blended learning while others do not. Some respondents express concern when using information technology and argue that blended learning does not contribute to motivation.

The knowledge obtained from this study will contribute significantly to both scientific and practical education by:

– Providing empirical evidence on the effectiveness of the flipped classroom model, identifying factors that influence student satisfaction, and offering insights into how blended learning impacts student motivation and academic performance.

– offering a structured framework for implementing the flipped classroom model, highlighting best practices, and providing actionable recommendations for educators. By understanding student perceptions and satisfaction levels, educators can tailor their teaching strategies to enhance learning outcomes and engagement.

Therefore, students' positive attitude towards the training method is an important factor affecting their motivation, engagement, and efficiency. Accordingly, research into the specific features of how future specialists in education and pedagogy perceive the flipped classroom model of blended learning is topical and practically significant.

### 2. Literature review

In pedagogical research, great attention is paid to determining the features of students' perception of their learning process. T.N. Bochkareva et al. (2020) found students' perception of teachers to affect the results of learning. D.K. Shah et al. (2019) focused their research on students' perception of learning, teachers, and the general atmosphere, as well as the features of students' academic and social self-perception, and based on the obtained results concluded the learning conditions to be satisfactory.

The introduction of blended learning involves a combination of traditional and online forms of educational process organization (Riczu et al., 2023). Researchers argue that the main reasons behind the efficiency of blended learning lie in the balance of online and in-person components, as well as student-lecturer and student-student interaction (Le, Pham, 2021; Wagner et al., 2023).

S. Pivneva et al. (2023) present a systematic analysis of various studies on the application of blended learning, concluding that blended learning has a positive effect on academic performance, social interaction, and feedback, improves group and reciprocal learning, and fosters a positive attitude to e-learning among future teachers.

According to a classification developed by L.Y. Belenkova et al. (2022), blended learning encompasses the rotation model (station rotation, laboratory rotation, flipped classroom, individual rotation), the flex model, the self-blended model, and the enriched virtual model.

Several studies examine the results of the application of the flipped classroom model of blended learning. Under the flipped classroom method, work that is usually performed in class at lectures is done at home (studying the content of the course using online tools) and homework is covered in the classroom (practical exercises, critical analysis, etc.) (Evans et al., 2020). The results of the introduction of the flipped classroom model show that students who study under this model score higher in the final examination. They feel well-prepared and confident, note greater satisfaction and a more positive learning environment, and value the opportunity to study at their own pace (Bolina et al., 2022). C. Little discovered a positive effect of the flipped classroom model on academic performance in a small group of students. Little noted the benefits of the fact that students were able to pause and rewind educational videos for better comprehension. The real advantages of this model, however, lie in much greater opportunities for active experimental learning and the development of higher-order cognitive skills (Babintseva et al., 2023). A.T. Steen-Utheim and N. Foldnes (2018) in their study emphasized the affective aspect of student engagement in the application of the flipped classroom. Their results indicate a more positive learning experience and greater engagement of students under flipped learning. The findings indicate that the emotional aspect of engagement is especially high in students' assessment of their learning in the flipped classroom.

Research has found that the most common reasons for a positive perception of the experience of blended learning are learning with the use of video materials (Tretyakova et al., 2023); the ability to study at one's own pace (Asghar et al., 2022); flexibility and mobility provided by the available video lectures (Denisova et al., 2023; Uteuliyev et al., 2023); and easier and more efficient learning in the flipped classroom (Ling et al., 2023).

The reasons behind students' perception of flipped learning as more active and efficient are associated with 1) the availability of video lectures (opportunity to think and study at their own pace) (Turanin, Posokhova, 2023); 2) more content-dense classroom sessions focused on practice and controlled by teachers (Baideldinova et al., 2021; Engelbertink et al., 2020); and 3) greater support for learning processes through interaction with teachers and peers in and outside the classroom through Moodle (Boelens et al., 2018).

However, little research attention has been paid to the application of the flipped classroom model of blended learning in student training and their attitudes to this form of work.

The purpose of our research is to establish the satisfaction of future specialists with the flipped classroom blended learning model implemented in their learning process.

The research hypothesis tested is that as a result of the implementation of the model, students' satisfaction with blended learning will closely correlate with learning outcomes and academic performance.

### 3. Methods

The set research goal was achieved through a set of methods, which included analysis of psycho-pedagogical and scientific methodological literature, a survey, and a pedagogical quasi-experiment (Syzdykova et al., 2022).

The primary research method was the pedagogical quasi-experiment, which was conducted over the second semester of the 2022–2023 academic year.

This study included 104 second-year students who were randomly selected to participate. The selection aimed to ensure a representative sample of students who had similar levels of academic experience and were part of pre-existing academic groups from various humanities disciplines. The ages of the participants ranged from 19 to 21 years old, with a gender distribution of approximately 60 % female and 40 % male.

The quasi-experiment proceeded in several stages (Table 1).

**Table 1.** Stages of the pedagogical quasi-experiment

| Stage | Content |
|---|---|
| Preparatory | Determination of the relevance, goal, objective, object, and subject of the experiment |
| Organizational | Preparation of methodological support, selection of participants, development of the structure of the flipped classroom model |
| Practical | Implementation of the flipped classroom blended learning model |
| Summarization | Assessment of results (student survey, academic performance assessment) |

The general structure of the flipped classroom is presented in Table 2.

**Table 2.** Structure of the developed flipped classroom model

| Stage | Types of activities during the stage |
|---|---|
| I General organization | Explanation of requirements, the peculiarities of work, the structure of the course, and the specifics and advantages of flipped learning |
| II Independent online homework | – Introduction to the topic: problem task, short video, or mini-presentation;<br>– Study of theoretical material by working with methodological materials on the distance learning platform and electronic library resources;<br>– Study of theoretical material using various video materials chosen by teachers on the topics using free Internet resources like YouTube and TED.com;<br>– Consultative support for students in the group by the teacher via chats, forums, e-mail, and messengers |
| | Control of learning outcomes: online testing on theoretical materials that have been covered in the relevant topic or assignments |
| III Joint work of the group in the classroom | Actualization of knowledge through control activities at the beginning of classroom work (a mini lecture to be given by one of the students, summary assignments, general discussion with answers to problem questions) |
| | – Individual practical work on problem tasks, specific practical cases, exercises, and assignments;<br>– Practical group work with joint discussions, debates, brainstorming, and role-playing with the exchange of ideas, opinions, and experiences and a search for optimal solutions |
| | Consolidation of the results of training: a short summarizing reflective exercise on the topic with brief responses on the new experience, the possibilities of its practical application, and what the student liked and remembered or disliked and found challenging |

Joint work of the academic group in the classroom was carried out in a synchronous distance mode using the Moodle distance learning system. As can be seen from Table 2, the conditions of organization of the flipped classroom model were maintained. Individual assignments at the practical stage not only diversified the types of activities but facilitated more active work. Before joint discussions, each student had the opportunity to decide on their point of view and reflect on solutions and their arguments.

To establish the specifics of students' perception of the blended learning model under which they were trained, an anonymous survey was conducted.

The survey consisted of two blocks. The block devoted to satisfaction included five questions addressing various aspects of blended learning:

– Are you satisfied with the quality and content of the materials presented to you?
– Do you find the distribution of the different types of activities satisfactory?
– Are you satisfied with the quality of interpersonal interaction and interactivity?
– Are you satisfied with individual work with electronic resources?
– Are you satisfied with the overall organization of blended learning?

In the block of questions dealing with efficiency, respondents were asked to assess their achievements:

– Do you remember the theoretical content of the course?
– Have you gained new skills that you could apply in practice?
– In your opinion, will you be able to use the obtained learning outcomes in future professional practice?
– In your opinion, has the studied course contributed to the quality of your future professional work?

Responses to all survey questions were given on a 5-point Likert scale: 5 – strongly agree, 4 – agree, 3 – neutral, 2 – disagree, 1 – strongly disagree.

Academic performance was determined by the formula: (number of "excellent" grades + number of "good" grades x 0.64 + number of "satisfactory" grades x 0.36 + number of "passing" grades x 0.16 + number of "not passing" grades x 0.08) x 100%/total number of students.

The results of the quasi-experiment were processed using mathematical statistics methods. The objective was to establish the presence or absence of a relationship between students' satisfaction with blended learning, their learning outcomes, and academic performance. For this purpose, we applied the Kolmogorov-Smirnov test and Spearman's rank correlation coefficient.

### 4. Results
The results of the survey block on satisfaction with blended learning are presented in Table 3.

**Table 3.** Results of the survey on respondents' satisfaction with blended learning

| Respondents' satisfaction | Responses | | | | |
|---|---|---|---|---|---|
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
| Quality and content of materials | 6 (5.8 %) | 16 (15.0 %) | 12 (11.9 %) | 24 (23.1 %) | 46 (44.2 %) |
| Distribution of types of work | 6 (5.5 %) | 12 (11.5 %) | 14 (13.8 %) | 46 (44.2 %) | 26 (25.0 %) |
| Interpersonal interaction and interactivity | 4 (3.7 %) | 7 (6.3 %) | 22 (21.2 %) | 40 (38 %) | 32 (30.8 %) |
| Individual work with electronic resources | 2 (2.0 %) | 12 (11.5 %) | 10 (9.6 %) | 47 (44.8 %) | 33 (32.1 %) |
| Overall organization of blended learning | 6 (5.8 %) | 6 (5.8 %) | 16 (15.3 %) | 40 (38.2 %) | 37 (34.9 %) |

As demonstrated in Table 3, most respondents (44.2 %) were completely satisfied with the quality and content of the presented materials. Another 23.1 % responded, "agree".

Results on the question about the distribution of work between different types of activities show that most of the respondents were somewhat satisfied (44.2 %). In total, satisfaction with the distribution of different types of activities (5 and 4 on the Likert scale) was expressed by 69.2 %.

Most of the respondents were somewhat satisfied (38 %) or completely satisfied (30.8 %) with opportunities to actively communicate and interact provided during the course. Another 21.2% reported "neutral" satisfaction. Dissatisfaction with the quality of interaction was expressed by 10% of the respondents.

Concerning individual work with electronic resources, the largest part of the students were somewhat satisfied or completely satisfied with the quality of this type of work (76.9 %). Only a minor share of students expressed neutral satisfaction (9.6 %) and relative (11.5 %) or complete (2%) dissatisfaction.

Responding to the question "Are you satisfied with the overall organization of blended learning?", most of the future specialists in education and pedagogy reported being satisfied: points 5 and 4 on the Likert scale were picked by 73.1 %. A small number of students – 5.8 % each – remained somewhat or completely dissatisfied.

Analyzing the results of the survey, we can conclude that the lion's share of the surveyed students had an overall positive perception of the blended learning model. Most of the received responses to all the survey questions were either "strongly agree" or "agree". The total sum of these responses ranged from 67.3 to 76.9 %. The greatest satisfaction was expressed with regard to individual work with electronic resources and the overall organization of blended learning (arithmetic mean of the responses – 3.94 and 3.9 points, respectively).

Next, let us consider the results of the survey on the efficiency of learning (Table 4).

The data provided in Table 4 show that students generally rated their theoretical knowledge after taking the course highly: 42.3 % saw their memorization of the theoretical content of the course as somewhat good and 28.8 % – as good.

**Table 4**. Results of the survey on efficiency

| Efficiency | Responses | | | | |
|---|---|---|---|---|---|
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
| Theoretical knowledge | 3 (3.1 %) | 8 (7.6 %) | 19 (18.2 %) | 44 42.3 %) | 30 (28.8 %) |
| New practical skills | 4 (3.8 %) | 6 (5.8 %) | 32 (30.8 %) | 30 28.8 %) | 32 (30.8 %) |
| Application in future professional practice | 4 (3.8 %) | 6 (5.8 %) | 18 (17.3 %) | 42 40.2 %) | 34 (32.9 %) |
| Improvement of the quality of teaching in the future | 4 (4.2 %) | 10 (9.8 %) | 13 (12.7 %) | 52 50.0 %) | 24 (23.3 %) |

An approximately equal share of students completely agreed (30.8 %), somewhat agreed (28.8 %), and moderately agreed (30.8 %) that they had gained new practical skills. Thus, one-third of the respondents believed they had obtained entirely new skills and a total of almost 60 % gave a positive answer to this question.

An intention to use the obtained learning outcomes in future professional practice was demonstrated by 73.1 % of students in total and 17.3 % were generally inclined to do so. Few of the survey participants believed they would not utilize the obtained learning outcomes (3.8 %) or expressed doubt (5.8 %).

Over 70 % were convinced that the training received would improve the quality of their professional work in the future.

To choose the right statistical methods to analyze the obtained data, we tested the normality of the distribution of students' responses on satisfaction with the flipped classroom blended learning model using the Kolmogorov-Smirnov test (Table 5).

**Table 5.** One-sample Kolmogorov-Smirnov test for students' satisfaction with the blended learning model

| | | Quality and content of materials | Distribution of types of work | Interpersonal interaction and interactivity | Individual work with electronic resources | Overall organization of blended learning |
|---|---|---|---|---|---|---|
| N | | 104 | 104 | 104 | 104 | 104 |
| Normality parameters[a, b] | Mean | 3.8512 | 3.7225 | 3.8319 | 3.9393 | 3.8968 |
| | SD | 1.31126 | 1.14448 | 1.07880 | 1.03594 | 1.12516 |
| Extremum difference | Modulus | .248 | .289 | .241 | .288 | .272 |
| | Positive | .191 | .148 | .141 | .155 | .163 |
| | Negative | -.248 | -.289 | -.241 | -.288 | -.272 |
| Kolmogorov-Smirnov test | | 1.829 | 2.104 | 1.711 | 2.105 | 1.908 |
| Asymptotic significance (two-sided) | | .002 | .000 | .006 | .000 | .001 |

Notes: a – Comparison with normal distribution, b – Estimated from the data

As can be seen from Table 5, asymptotic significance is less than 0.05, meaning that the distribution of students' answers is non-normal. Therefore, statistical calculations were performed using a nonparametric method.

Accordingly, correlations between the variables were detected via Spearman's test. The results of the calculations are given in Table 6.

Table 6 demonstrates that all assessed variables positively correlate with one another, as all obtained coefficients are above zero. This indicates that respondents' assessments of their theoretical knowledge, new practical skills, intent to apply the learning outcomes in future professional work, and opportunities to raise the quality of future work are significantly connected with their satisfaction with the flipped classroom blended learning model.

**Table 6.** Correlation between respondent satisfaction with blended learning
and their learning outcomes

| Respondents' satisfaction | Outcome block of questions | | | |
|---|---|---|---|---|
| | Theoretical knowledge | New practical skills | Application in future professional practice | Improvement of the quality of teaching in the future |
| Quality and content of materials | .485** | .554** | .646** | .652** |
| Distribution of types of work | .513** | .548** | .442** | .628** |
| Interpersonal interaction and interactivity | .626** | .517** | .479** | .611** |
| Individual work with electronic resources | .439** | .428** | .518** | .561** |
| Overall organization of blended learning | .608** | .531** | .357** | .572** |

Notes: **correlation significant at the level of 0.01

Apart from students' self-assessment of the efficiency of their training, we utilized a more objective indicator – academic performance on a 100-point scale. Results on the correlation of respondents' satisfaction with the flipped classroom model and their academic performance are shown in Table 7.

**Table 7**. Correlation between respondent satisfaction with blended learning
and their academic performance

| Respondents' satisfaction | Students' academic performance |
|---|---|
| Quality and content of materials | .468** |
| Distribution of types of work | .449** |
| Interpersonal interaction and interactivity | .413** |
| Individual work with electronic resources | .478** |
| Overall organization of blended learning | .391** |

Notes: **correlation significant at the level of 0.01

Table 7 shows that students' satisfaction has a significant positive correlation with their academic performance, as all obtained coefficients are above zero.

**5. Discussion**
Proceeding from the results of the study, we would like to emphasize the importance of students' positive attitude to the method of training and stress the need to study students' perception of the blended learning model to find ways to improve the model and raise the efficiency of the educational process overall. We believe that students' perception of the training model should be continuously monitored and the factors affecting their satisfaction and the development of a positive attitude to learning need to be determined.

According to our observations, the application of the blended learning model can contribute to the development of such qualities of future specialists in education and pedagogy as a general cognitive-research orientation, high cognitive needs, responsibility, self-organization, and ability to self-learning and self-development, which makes the application of such a model particularly interesting and potentially valuable.

The conducted theoretical analysis suggests that factors in students' positive perspective on the flipped classroom blended learning model include: the combination of the advantages of face-to-face and online learning; the diversity of activities; accessibility, flexibility, and mobility; the ability to study at their own pace; expanded opportunities for interaction with teachers and peers; greater variability in learning; more active learning; a sense of safety and a positive environment; interest in the content of educational materials for independent learning; receiving timely feedback; more

meaningful classroom sessions with a focus on higher-level cognitive activities, broad opportunities for practice and engagement; more effective learning (Bolina et al., 2022).

Importantly, the reviewed studies also report an improvement in students' academic performance as a result of this method (Denisova et al., 2023). Notably, a considerable share of these studies utilize the survey method (Le, Pham, 2021). The conducted analysis allowed us to develop a survey specifically for the present study to investigate the attitudes of future specialists to blended learning and their self-assessment of the obtained results both in knowledge and skills and as readiness to apply the received knowledge in future professional practice.

Another important point is that some of the factors in students' positive perceptions of the blended learning model stem from the essence of this method itself. Among these factors are the combination of the advantages of face-to-face and online learning, the opportunity to study at one's own pace, and accessibility and flexibility. Other analyzed factors can be considered when developing and introducing the blended learning model (diversity of activities, variability, feedback, more effective learning, etc.). The conclusions reached allow us to outline the following conditions for ensuring students' positive perception of and satisfaction with the flipped classroom blended learning model:

– diverse forms of presentation of new educational materials (videos, texts, illustrative materials from different sources with educational and scientific materials on the topic);

– diverse types of activity to improve activity and interest (written and verbal assignments, creating visual content; assignments focusing both on the reproduction of knowledge and problem-based, creative tasks with critical analysis and practical application);

– combination of individual, micro group, and group work;

– support and consultations in independent work, expanding opportunities for interaction and assistance;

– provision of control and feedback.

The last point, in our view, deserves special attention. As indicated earlier, the efficiency of training contributes to students' positive perception of the educational process, which is supported by the findings of J.C. Evans et al. (2020). Our study suggests that the indicator of efficiency of learning (which integrates a variety of factors in education) affects how satisfied the student is with their overall learning experience.

The analyzed sources (Riczu et al., 2023; Steen-Utheim, Foldnes, 2018) indicate that students can have insufficient engagement in the educational process, and if a student comes to class unprepared, the general efficiency of the flipped classroom model undoubtedly decreases. Therefore, it is particularly important to utilize a variety of additional methods of motivation and control. In our study, among these methods were independent extracurricular testing or control tasks after completing the stage of independent online work, brief testing at the beginning of class sessions, and summarizing reflective control exercises at the end of the topic.

*Despite the results, limitations must be considered when interpreting the findings of this study. The study was conducted with a small sample size of 104 students, which may limit the generalizability of the findings. Also, the study was conducted in the context of humanities disciplines and may not be directly applicable to other academic disciplines or educational settings with different cultural, institutional, and pedagogical contexts.*

## 6. Conclusion

Considering the features of blended learning will provide for the effective introduction and optimal combination of the forms, methods, and tools of both traditional and distance computer-based and mobile learning in the educational process. The analysis of various blended learning models and the features of their implementation shows their potential capabilities in the organization of specialist training.

The hypothesis put forward in the study was confirmed since we found that more than two-thirds of the surveyed students had a positive view of the flipped classroom blended learning model. The respondents expressed satisfaction with blended learning and rated their achievements high. The correlation analysis showed a significant positive connection between the variables of satisfaction and student self-assessment of their learning outcomes. A significant correlation was also found between student satisfaction and academic performance. The conducted theoretical and experimental analysis demonstrates the significant potential of the flipped classroom blended learning model. Drawing on these findings, we recommend implementing this model based on the

proposed structure in the process of vocational training, particularly as part of developing leadership in future specialists in education and pedagogy. We also believe that the characteristics of students' perception of the learning model should be continuously monitored to obtain timely feedback from students and perfect the educational process. Prospective further research may focus on determining and comparing the efficiency of various blended learning models.

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**European Journal of Contemporary Education**

ELECTRONIC JOURNAL

# Entrepreneurship Culture and Entrepreneurship Education Affect Students' Entrepreneurship Intentions Through Entrepreneurship Perception

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**Abstract**
This study aims to explore the impact of culture and education on students' entrepreneurial intentions by assessing entrepreneurship's perceived feasibility and desirability by using the PLS-SEM structural model analysis method. A survey of students in Vietnam was conducted with 1869 participants. The research results indicate that, as the cultural and educational environment increasingly supports entrepreneurial activities, students are increasingly recognizing the desirability and feasibility of engaging in entrepreneurial endeavors. Moreover, educational institutions, particularly universities, should prioritize teaching and training students in resilience, willingness to face challenges, and the courage to take risks. The study also highlights the need for faculty members with practical business management experience to foster an environment conducive to developing individual capabilities, providing effective student learning support, and inspiring the entrepreneurial spirit among young people.

**Keywords:** entrepreneurship culture, entrepreneurship education, entrepreneurship intentions, entrepreneurship perception, perceived feasibility, perceived desire to start a business.

## 1. Introduction

In Vietnam, the startup movement has received attention from the government, society, and community. According to the Annual Report of Do Ventures and Cento Ventures, Vietnam's startup ecosystem has jumped from fifth to third position among the top six economies in ASEAN, just behind Indonesia and Singapore in 2022, and has shown interest in and created conditions as well as environmental and policy support for businesses (Dinh Vu, 2022). According to statistics from the VCCI Federation, in 2021 alone, on average, there were about 13,300 newly registered businesses each month. However, investing in and encouraging startups for professionally trained students to participate in the labour market is necessary to create a strong foundation for

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entrepreneurship and for the future. Future movements represent sustainable investment trends (Linan et al., 2011). According to statistics from the Ministry of Education and Training, nearly 30 % of higher education institutions include entrepreneurship subjects in their training programmes as mandatory electives; this shows the importance of entrepreneurship. Businesses are receiving attention; however, a startup still needs to be clearly defined. Accordingly, startup activities are determined not only to apply and innovate in terms of technology but also to provide new recruitment opportunities and include activities to increase competitiveness (Reynolds, 1987).

Although entrepreneurship brings much value to individuals as well as the national economy in general, it also faces many challenges, so most previous studies have focused on exploiting and understanding the reasons for starting a business and emphasized the individual's personality, characteristics, and willingness to cope with risks (Liñán et al., 2011). However, a person is a subject living in society and faces risks from many sources in the surrounding living environment, such as family, friends, school and society, culture, and politics. Therefore, the above factors significantly affect individuals' intention to start a business. In Vietnam, students majoring in business administration tend to love business activities and buying and selling, and they have a dynamic personality. Because of choice, career orientation comes from one's personality and family orientation, so exploiting personal factors does not seem to explain the problem clearly. Previous studies have shown that students' entrepreneurial intentions increase following their engagement in entrepreneurship education and enrollment in business courses (Anwar, Saleem, 2019; Boldureanu et al., 2020). Entrepreneurship education enables students to advance through a focus on innovation and future-oriented career development (Ratten, Jones, 2020). This suggests that students possess diverse career pathways as entrepreneurs, spanning from small enterprises to well-established companies. Entrepreneurship education further provides students with the opportunity to acquire skills and management training, enhancing their entrepreneurial knowledge, fostering entrepreneurial thinking, and deepening their understanding of management, thereby boosting their entrepreneurial intentions (Hahn et al., 2017).

Besides entrepreneurship education, Pfeifer et al. (2016) and Solesvik et al. (2013) pointed out that entrepreneurial intention is associated with cognition. Increased awareness of entrepreneurship positively impacts any actions that may induce cognitive shifts and strengthen the nexus between entrepreneurial intentions and activities (Mathisen, Arnulf, 2013). In addition, students need an entrepreneurial mindset to deal with changes and build creative thinking to respond to new economic circumstances. Conversely, Jabeen et al. (2017) demonstrated the role of culture in entrepreneurship. Cultural factors can drive individual behaviour, including decision making and career choices as entrepreneurs. Investing in startups has a long-term positive effect on economic development and national disputes, so providing young people with a culture of entrepreneurship is essential. Hence, the purpose of this study is to examine the cultural and educational factors related to entrepreneurship that influence the entrepreneurial intentions of Vietnamese students. From the research results, it is possible to identify factors that serve as a basis for schools and related units to propose solutions to increase students' entrepreneurial intentions.

## 2. Literature review

Entrepreneurial intention is a cognitive state of mind about taking action and focusing on achieving the goal of starting a new business enterprise (Bird, 1988). Thompson (2009) identified entrepreneurial intention as an individual's belief that they intend to establish a new business at some point in the future (Thompson, 2009). According to Lee et al. (2006), the emphasis on the entrepreneurial spirit is widespread globally, recognized as a means to stimulate economic growth and job creation. Sobel and King (2008) asserted that initiating businesses is a crucial factor for economic advancement, making it a top priority for policymakers to encourage young individuals to embark on entrepreneurial ventures. Entrepreneurial intention is a concept that scholars have studied for decades.

Previous studies have used different background theories as the basis for the relationships between factors influencing entrepreneurial intention. This study summarizes three approaches based on groups of background theories on students' entrepreneurial intention: the environment's effects on entrepreneurial intention, the educational programme, and the learner (motivation, personality, thinking, attitude, gender).

Research directions are related to environmental factors, such as "family support", "entrepreneurship example", "national culture", "social capital", and "social factors" (Chand,

Ghorbani, 2011; Pruett et al., 2009). The environment that affects students' entrepreneurial intentions can be deduced and explained by institutional, cultural, and social exchange theories. The institutional theory proposed by North (1990) is used to explain the relationship between entrepreneurship education programmes and environmental factors. The cultural and institutional environment shapes the social structures within which organizations operate through policies (Fligstein, 1997). Thus, the cultural and institutional environment shapes education, economics, and law policies. In societies in which clear legal policies and material and intellectual resources to support business formation are fully provided, people will be motivated to start and develop businesses (Nguyen et al., 2009). The distinctions in the relationships within the factor model influencing the intention to initiate a business, particularly those associated with "national culture," can be elucidated by the Cultural Disposition Theory (Hofstede, 1980) and the Value Theory (Schwartz et al., 2001). Culture, at its essence, is shaped by the values held by individuals in a society, as reflected in their opinions, thoughts, beliefs, and behaviors (Hofstede et al., 2010). These cultural theories can shed light on how students' thoughts and intentions regarding entrepreneurship are influenced. Based on the results from previous studies, this approach has been the focus of a few repeated testing studies. The research by Ang and Hong (2000) compared the entrepreneurial spirit of students from Hong Kong and Singapore based on the role of personal characteristics, such as creative ability to innovate and willingness to take risks. However, humans are social individuals, so environmental factors influence their behaviours. Therefore, subsequent studies focused on exploring further the role of contextual factors. Scott and Twomey (1988) analysed the influence of parents on entrepreneurship. Lee et al. (2005) further investigated the role of culture when comparing four different countries in terms of entrepreneurial intention. Other studies, such as that by Autio et al. (1997), have examined the role of schools in motivating students to engage in entrepreneurship.

Regarding educational programmes, Åstebro et al. (2012) provided evidence that entrepreneurship is not only a programme for business students but also an essential programme for students in the natural sciences, engineering, and even the arts in the US. Rae and Woodier-Harris (2013) believed that establishing a comprehensive entrepreneurship curriculum for students is crucial for businesses aiming to cultivate a strong knowledge foundation and successful business management. This curriculum should equip students with the essential knowledge required to initiate a successful business and choose a fitting career path. Huber et al. (2014) assessed the effectiveness of early entrepreneurship education for primary school children in the Netherlands. They demonstrated that early investment in entrepreneurship education for children as young as 11 or 12 improves entrepreneurial knowledge and skills. Research on entrepreneurship education tailored to the cultural, economic, and political characteristics of individual countries is essential. Such studies would make a substantial contribution to the overarching theory and practical applications of graduate education.

Many researchers have used traits theory combined with motivation theory (Maslow, 1970) and value theory combined with the theory of planned behaviour (Ajzen, 1991) to explain the relationship between individual characteristics and entrepreneurial intention. According to this approach, different personalities of each individual will affect their behavioural and thus their entrepreneurial intentions (Espíritu-Olmos, Sastre-Castillo, 2015); students' attitude towards entrepreneurship affects their entrepreneurial intentions, as proposed and tested by Boissin et al. (2009) and Wu and Wu (2008).

### 3. Research hypotheses
**The nexus between entrepreneurial culture and entrepreneurial education, entrepreneurial awareness, and entrepreneurial intention**

Chand and Ghorbani (2011) argued that variations in national culture lead to businesses being established and managed differently (financial management, control, employee training, etc.). National culture also plays a pivotal role in shaping and utilizing social capital. Therefore, in each different country, students' entrepreneurial intentions will be different. Pruett et al. (2009) provided evidence supporting the positive impact of "culture/country," "social factors," "typical role models in entrepreneurship," "family support," and "entrepreneurial inclination" on "entrepreneurship intention." Existing literature suggests that entrepreneurial culture has the potential to mold students' perspectives on entrepreneurship (Dewi et al., 2019; Yusof et al., 2017). To explain this relationship, social cognitive theory (SCT) was implemented in this study. SCT

shows the interaction between cognitive variables, environmental factors, culture, and individual behaviour (Bandura, 2001). Entrepreneurial mindset is a type of individual cognitive variable influenced by entrepreneurial culture, entrepreneurial education, and extracurricular activities (Cui et al., 2019). Some previous studies have shown that entrepreneurial thinking can be influenced and learned through individuals' initial knowledge and interaction with today's culture and environment (Mathisen, Arnulf, 2013). Similarly, Jabeen et al. (2017) and Shepherd et al. (2010) noted that an entrepreneurial culture within an organization actively encourages learning and the development of an entrepreneurial mindset.

Sesen (2013) further analysed the Schwarz model in terms of environmental factors, including "business information", "social relationships", and "university startup environment". The research results show that, as well as factors such as "access to capital" and "startup environment at university", there are "business information" and "social relationships" factors; the "startup environment at university" positively affects "startup intention".

Beyond fostering entrepreneurial thinking, community or educational organizational culture is intertwined with entrepreneurial education. Education serves as a public avenue for integrating comprehensive and objective entrepreneurship education across all educational levels (Nowinski et al., 2019). Blenker et al. (2012) highlighted a significant increase in the number of entrepreneurship courses contributing to cultural transformation in Western countries. In alignment with this trend, policymakers have introduced an academic focus to enhance cultural engagement in educational institutions (Khalid et al., 2019). One manifestation of this cultural influence is the growing availability of entrepreneurship courses in educational institutions (Farny et al., 2016). Therefore, the proposed hypotheses are as follows:

H1: Entrepreneurship culture affects entrepreneurship education.
H2: Entrepreneurship culture affects the perception of startup feasibility.
H3: Entrepreneurship culture affects the perception of the desire to start a business.
H4: Entrepreneurship culture affects startup intention.

**The nexus between entrepreneurship education, entrepreneurship awareness, and entrepreneurial intention**

Entrepreneurship education encompasses all the educational activities undertaken to develop students' entrepreneurial intentions (Li, Wu, 2019). Entrepreneurship education helps students to improve their entrepreneurial awareness and skills and provides students with alternative careers as entrepreneurs (Jena, 2020; Ratten, Jones, 2020). In addition, Viaz and Rivera-Cruz (2020) offered different understandings of entrepreneurship education as a teaching and learning activity that can identify entrepreneurial attitudes, such as autonomy, creativity, innovation, or taking risks and being creative in business. Meanwhile, Wu and Wu (2008) argued that entrepreneurship education can enhance students' management abilities to support their business activities. The university entrepreneurship education model equips students with the skills to pursue a startup career, especially through entrepreneurship teaching materials. This implies that entrepreneurship education strongly correlates with entrepreneurial intention (Hassi, 2016; Khalifa, Dhiaf, 2016).

Aşkun and Yildirim (2011) demonstrated that entrepreneurship courses greatly influence students' entrepreneurial intentions; their research supported business creation through entrepreneurship education programmes. Hong et al. (2012) believed that the quality of student entrepreneurship is related to the entrepreneurship education programme because it enriches knowledge about entrepreneurship and develops entrepreneurial skills for students. Universities must pay more attention to their entrepreneurship education programmes, focusing on student businesses, connecting with society, giving students more entrepreneurial opportunities, and providing internship opportunities and practical experience (Hong et al., 2012). In the context of hands-on entrepreneurship education, Taatila and Down (2012) determined that students in various training programs exhibit distinct inclinations toward entrepreneurship. Those with prior business experience are more likely to embark on entrepreneurial ventures compared to their counterparts without such experience. Moreover, students who perceive entrepreneurship positively as a career choice are more prone to initiating businesses than those who consider entrepreneurship a risky endeavor. An entrepreneurial mindset is characterized by the capability to identify, contemplate, and act upon opportunities rather than viewing challenges as hindrances (Jabeen et al., 2017). Ridley et al. (2017) also explained that an entrepreneurial mindset encompasses an individual's ability to make decisions in uncertain situations. Learning methods

and classroom activities are most likely to enhance college students' cognitive abilities directly, enabling them to participate in entrepreneurial activities actively (Solesvik et al., 2013). They also allow students to develop as learners and gain the necessary experience. The educational learning process includes ethnographic user research, brainstorming methods, collaborative activities, and advanced business practices that enable undergraduate students to develop their ability to find creative and critical solutions based on their learning experiences (Dehghani et al., 2018). These practical aspects enhance entrepreneurial thinking (Bogatyreva et al., 2019). Therefore, this study proposes the following hypotheses:

H5: Entrepreneurship education affects the perception of the feasibility of entrepreneurship.

H6: Entrepreneurship education affects students' awareness of their desire to start a business.

H7: Entrepreneurship education affects startup intention.

**The nexus between entrepreneurial awareness and entrepreneurial intention**

Based on Ajzen's theory of planned behaviour (TPB) (1991), previous studies have built a model of factors affecting students' entrepreneurial intention. Wu and Wu's (2008) model shows that "attitude towards entrepreneurship" and "behaviour-related control appraisal" both positively affect students' "entrepreneurship intention". Some preliminary research has demonstrated the belief in the entrepreneurial mindset as a mindset that certainly drives individuals' behaviour towards entrepreneurship-related culture and outputs (Akmaliah et al., 2016; Linan, Fayolle, 2015). This research noted that entrepreneurial thinking is closely related to an individual's thinking. Shepherd et al. (2010) supported this view and confirmed that entrepreneurial thinking provides insights into several essential outcomes for entrepreneurship research. To explain the role of entrepreneurial awareness, including perceived feasibility and perceived entrepreneurial desire, mediating entrepreneurial culture and entrepreneurial education in entrepreneurial intention, we refer to Bandura's (2001) social cognitive theory (SCT). Specifically, SCT proposes interactions between cognitive variables and environmental factors, including culture and individual behaviour (Bandura, 2001). The latest research by Cui et al. (2019) demonstrates that SCT offers a comprehensive framework for comprehending the role of determinants in extensive entrepreneurship education, particularly from the perspective of cognitive psychology. Cui et al. (2019) and Winkler & Case (2014) also pinpointed cultural, curricular, and extracurricular factors, such as learning activities or experiences, that impact cognitive elements like entrepreneurial mindset, inspiration, motivation, self-efficacy, and entrepreneurial intention. In essence, entrepreneurial culture and education bring about shifts in thinking and emotions (Gibb, 2002; Haynie et al., 2010), ultimately influencing the intentions of students. Therefore, this study proposes the following hypotheses:

H8: Perceived feasibility has a positive impact on the perceived desire to start a business.

H9: Perceived feasibility has a positive impact on startup intention.

H10: Perceived desire to start a business has a positive impact on startup intention.

## 4. Methodology
**Study design**

The study was conducted in two phases: a preliminary study and a formal quantitative study. The preliminary study used a focus group interview technique with eight direct managers of startup businesses operating in Ho Chi Minh City. The goal was to revise the draft survey to eliminate ambiguous questions and semantic errors. The revised survey was used for the formal quantitative study phase. A quota sampling method was used in the study because the sample frame was not defined. The total sample size for analysis, after cleaning, was 1869. The entrepreneurial culture scale was inherited from the scale by Ireland, Covin and Kuratko (2009), MacKenzie, Podsakoff and Podsakoff (2011), and Mukhtar, Wardana, Wibowo and Narmaditya (2021). The perception of desire scale was adopted from the study by Krueger et al. (2000), the perception of feasibility scale was acquired from the studies by Krueger et al. (2000) and Schlaegel and Koenig (2014), and the entrepreneurial intention scale was inherited from the study by Linan and Chen (2009). All the scales in this study used a 5-point Likert scale. The model was tested for fit, reliability, and validity based on the scale analysis method.

Statistical analysis

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed for the analysis due to its effectiveness in handling complex models with multiple constructs and

indicators, and its suitability for exploratory research. The statistical analysis was conducted using SmartPLS 4, a software specifically designed for PLS-SEM analysis.

The measurement model was assessed for reliability and validity. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR), with values above 0.7 considered acceptable. Convergent validity was confirmed with Average Variance Extracted (AVE) values exceeding 0.5. Discriminant validity was established using the Fornell-Larcker criterion and the HTMT ratio.

The structural model was evaluated by analyzing the path coefficients, tested for significance using bootstrapping with 5,000 resamples. Model fit was assessed with the Standardized Root Mean Square Residual (SRMR), targeting values less than 0.08. The explanatory power of the model was measured by the coefficient of determination ($R^2$).

Hypotheses were tested by examining the t-values and p-values of the path coefficients, with a significance threshold set at $p < 0.05$. Effect sizes ($f^2$) were calculated to understand the impact of exogenous constructs on endogenous constructs. Multicollinearity among predictors was checked using the Variance Inflation Factor (VIF), ensuring all values were below 5. The overall model evaluation included the SRMR for fit, $R^2$ for explanatory power, and $Q^2$ for predictive relevance.

**Participants**

A survey of students in Vietnam was conducted with 1869 participants. The proportion of university-educated students was the largest, constituting 92.83 % of the sample. Following this, 6.96 % of students were enrolled in college, and a mere 0.21 % were attending vocational schools. Among the student body, those in their second year of study constituted the largest cohort, with 31.25 %, while those in the third year accounted for 28.79 %. The proportions of students in their first and fourth years were similar, standing at 20.76 % and 19.05 %, respectively. A mere 0.16 % of students were continuing their education beyond the standard four-year period.

Moreover, the gender distribution of the survey sample shows that female students comprised 67.58 % of the total sample, surpassing their male counterparts with 32.42 %. This can be partly explained by the survey's accessibility to a majority of students in social science disciplines, in which the enrolment of female students exceeds that of male students. Additionally, among the study participants, those with permanent residency in other provinces or cities constituted the predominant demographic, with 80.68 %. Students with permanent residency in Hanoi accounted for 12.15 %, while those in Ho Chi Minh City represented 7.17 %.

**Table 1.** Summary of sample

| Characteristics | Items | Frequency | Percentage |
|---|---|---|---|
| **Education** | Universities | 1735 | 92.83% |
| | Colleges | 130 | 6.96% |
| | Vocational schools | 4 | 0.21% |
| **Year of study** | First year | 388 | 20.76% |
| | Second year | 584 | 31.25% |
| | Third year | 538 | 28.79% |
| | Fourth year | 356 | 19.05% |
| | More than 4 years | 3 | 0.16% |
| **Gender** | Female | 1263 | 67.58% |
| | Male | 606 | 32.42% |
| **Residency** | Hanoi city | 227 | 12.15% |
| | Ho Chi Minh City | 134 | 7.17% |
| | Others | 1508 | 80.68% |

**5. Results and discussion**

After the model was tested and insufficient variables were excluded from the measurement model, the measurement scales attained reliability and validity as the factor loadings of the items ranged from 0.736 to 0.906 and the Cronbach's alphas were higher than 0.881; the composite reliability was above 0.885 (see also Table 2). In addition, the average variance extracted of the

constructs was higher than 0.5; hence, all the criteria for determining the convergent validity of the constructs were satisfied (Gerbing, Anderson, 1988; Hair et al., 2018).

**Table 2.** Measurement of concepts

| Constructs | Item | Factor loading | Cronbach's alpha | CR (Rho A) | CR (Rho C) | Average variance extracted (AVE) |
|---|---|---|---|---|---|---|
| Entrepreneurship Education (EDU) | EDU01 | 0.870 | 0.881 | 0.885 | 0.918 | 0.736 |
| | EDU02 | 0.855 | | | | |
| | EDU03 | 0.889 | | | | |
| | EDU04 | 0.816 | | | | |
| Entrepreneurship Intentions (EI) | EI01 | 0.870 | 0.930 | 0.932 | 0.946 | 0.744 |
| | EI02 | 0.861 | | | | |
| | EI03 | 0.906 | | | | |
| | EI04 | 0.893 | | | | |
| | EI05 | 0.878 | | | | |
| | EI06 | 0.759 | | | | |
| Perceived Desirability (PED) | PED02 | 0.868 | 0.906 | 0.910 | 0.930 | 0.727 |
| | PED03 | 0.808 | | | | |
| | PED04 | 0.878 | | | | |
| | PED05 | 0.886 | | | | |
| | PED06 | 0.821 | | | | |
| Perceived Feasibility (PEF) | PEF01 | 0.848 | 0.892 | 0.893 | 0.921 | 0.700 |
| | PEF02 | 0.867 | | | | |
| | PEF03 | 0.843 | | | | |
| | PEF04 | 0.884 | | | | |
| | PEF05 | 0.736 | | | | |
| Entrepreneurship Culture (CUL) | EC01 | 0.856 | 0.915 | 0.916 | 0.937 | 0.747 |
| | EC02 | 0.870 | | | | |
| | EC03 | 0.902 | | | | |
| | EC04 | 0.827 | | | | |
| | EC05 | 0.865 | | | | |

Moreover, the heterotrait−monotrait (HTMT) index (Henseler et al., 2015) and the Fornell and Larker criterion (Bagozzi et al., 1991; Fornell, Larcker, 1981; Hair et al., 2018) revealed that the scales of the variables achieved discriminant validity (see also Table 3).

Table 3. Discriminant validity

| **Fornell−Larcker** | | | | | |
|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** |
| 1. Entrepreneurship Culture (CUL) | 0.864 | | | | |
| 2. Entrepreneurship Education (EDU) | 0.583 | 0.858 | | | |
| 3. Entrepreneurship Intentions (EI) | 0.652 | 0.728 | 0.863 | | |
| 4. Perceived Desirability (PED) | 0.654 | 0.685 | 0.817 | 0.853 | |
| 5. Perceived Feasibility (PEF) | 0.660 | 0.780 | 0.810 | 0.768 | 0.837 |
| **HTMT** | | | | | |

|  | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Entrepreneurship Culture (CUL) |  |  |  |  |  |
| 2. Entrepreneurship Education (EDU) | 0.642 |  |  |  |  |
| 3. Entrepreneurship Intentions (EI) | 0.707 | 0.792 |  |  |  |
| 4. Perceived Desirability (PED) | 0.716 | 0.754 | 0.884 |  |  |
| 5. Perceived Feasibility (PEF) | 0.729 | 0.876 | 0.890 | 0.847 |  |

Table 4 shows that the variance inflation factor (VIF) indicators of the exogenous variables were all between 1.970 and 3.671 and thus less than 5.0; therefore, there was no sign of multicollinearity in this sample (Hair et al., 2019). The level of explanation of variables was, for example, 76 % for entrepreneurship intentions, 64 % for perceived desirability, 67.3 % for perceived feasibility, and 34 % for entrepreneurship education. Thus, the explanatory level of entrepreneurship awareness accounted for a large proportion and played an important role. The $Q^2$ indicators of the constructs in the model revealed that the predictability scores for EI, EDU, PED, and PEF were high compared with the criteria of 0.035 according to Cohen (1988).

**Table 4.** Measurement indicators

| Constructs | Rho_A | Composite Reliability | AVE | VIF | $R^2$ | $R^2_{adj}$ | $Q^2$ |
|---|---|---|---|---|---|---|---|
| Entrepreneurship Education (EDU) | 0.885 | 0.918 | 0.736 | 2.701 | 0.340 | 0.339 | 0.339 |
| Entrepreneurship Intentions (EI) | 0.932 | 0.946 | 0.744 |  | 0.760 | 0.760 | 0.424 |
| Perceived Desirability (PED) | 0.910 | 0.930 | 0.727 | 2.779 | 0.640 | 0.640 | 0.427 |
| Perceived Feasibility (PEF) | 0.893 | 0.921 | 0.700 | 3.671 | 0.673 | 0.673 | 0.435 |
| Entrepreneurship Culture (CUL) | 0.916 | 0.937 | 0.747 | 1.970 |  |  |  |

The results of the bootstrap analysis with 500 subsamples are presented in Figure 1 and Table 5. All the suggested relationships in the research model were supported and comparable to those discussed in the theory. Accordingly, entrepreneurship culture (CUL) had a significant effect on entrepreneurship education (EDU) (H1, 0.583, p-value < 0.05), as did perceived feasibility (PEF) (H2, 0.311, p-value < 0.05) and perceived desirability (PED) (H3, 0.240, p-value < 0.05). Among the factors affecting entrepreneurship intentions, perceived desirability and perceived feasibility had the most significant impact (0.417 and 0.327, H9 & H10), followed by entrepreneurship education (0.140, H7) and culture (0.082, H4). Entrepreneurship education in turn affected entrepreneurship perception, for which the impact on PEF (H5, 0.599) had a greater effect than that of PED (H6, 0.179). Furthermore, PEF had strong effects on PED (H8, 0.470). Table 6 shows the indirect effect of CUL and EDU on EI via PED and PEF.

**Table 5.** Hypotheses testing results

|  | Hypotheses | Coefficient | STDEV | T-Statistics | $f^2$ | Conclusion |
|---|---|---|---|---|---|---|
| H1 | CUL -> EDU | 0.583[***] | 0.018 | 31.835 | 0.514[***] | Supported |
| H2 | CUL -> PEF | 0.311[***] | 0.021 | 14.926 | 0.195[***] | Supported |
| H3 | CUL -> PED | 0.240[***] | 0.025 | 9.519 | 0.088[***] | Supported |
| H4 | CUL -> EI | 0.082[***] | 0.022 | 3.650 | 0.014 | Supported |
| H5 | EDU -> PEF | 0.599[***] | 0.020 | 29.394 | 0.725[***] | Supported |
| H6 | EDU -> PED | 0.179[***] | 0.029 | 6.195 | 0.034[**] | Supported |

| | | | | | | |
|---|---|---|---|---|---|---|
| **H7** | EDU -> EI | 0.140*** | 0.026 | 5.386 | 0.030*** | Supported |
| **H8** | PEF -> PED | 0.470*** | 0.030 | 15.579 | 0.200*** | Supported |
| **H9** | PEF -> EI | 0.327*** | 0.033 | 9.777 | 0.122*** | Supported |
| **H10** | PED -> EI | 0.417*** | 0.029 | 14.525 | 0.261*** | Supported |

The f² coefficient showed the predictability of the factors in the model, whereby H1 and H5 had a large effect size, H2 and H8 had medium effect sizes, and H3, H6, H7, and H9 had small effect sizes, while H4 was considered to have no effect. Therefore, CUL can affect EDU and EDU influences the entrepreneurship perception, specifically PEF, and eventually has an impact on EI.

**Table 6.** Indirect effects

| Total indirect effects | Effects | STDEV | T statistics |
|---|---|---|---|
| CUL -> EI | 0.570*** | 0.017 | 34.128 |
| CUL -> PED | 0.414*** | 0.018 | 23.285 |
| CUL -> PEF | 0.349*** | 0.015 | 22.664 |
| EDU -> EI | 0.388*** | 0.023 | 16.680 |
| EDU -> PED | 0.281*** | 0.021 | 13.264 |
| PEF -> EI | 0.196*** | 0.018 | 10.827 |
| **Specific indirect effect** | **Effects** | **STDEV** | **T statistics** |
| CUL -> EDU -> EI | 0.081*** | 0.015 | 5.381 |
| CUL -> EDU -> PED -> EI | 0.043*** | 0.008 | 5.324 |
| EDU -> PED -> EI | 0.075*** | 0.014 | 5.379 |
| CUL -> EDU -> PEF -> EI | 0.114*** | 0.013 | 8.762 |
| EDU -> PEF -> EI | 0.196*** | 0.022 | 9.000 |
| CUL -> EDU -> PEF -> PED -> EI | 0.068*** | 0.007 | 9.765 |
| EDU -> PEF -> PED -> EI | 0.117*** | 0.012 | 10.124 |
| PEF -> PED -> EI | 0.196*** | 0.018 | 10.827 |
| CUL -> PED -> EI | 0.100*** | 0.012 | 8.298 |
| CUL -> PEF -> EI | 0.102*** | 0.012 | 8.822 |
| CUL -> PEF -> PED -> EI | 0.061*** | 0.007 | 8.612 |
| PEF -> PED -> EI | 0.196*** | 0.018 | 10.827 |
| EDU -> PED -> EI | 0.075*** | 0.014 | 5.379 |
| EDU -> PEF -> EI | 0.196*** | 0.022 | 9.000 |
| EDU -> PEF -> PED -> EI | 0.117*** | 0.012 | 10.124 |
| PEF -> PED -> EI | 0.196*** | 0.018 | 10.827 |
| PEF -> PED -> EI | 0.196*** | 0.018 | 10.827 |

Figure 1 shows the relationships in the research model; black arrows indicate supported relationships in which CUL had positive effects on EDU, PED, and PEF as well as EI. EDU had positive effects on PED, PEF, and EI. Within the entrepreneurship perception, PEF had strong effects on PED. Both PEF and PED had positive effects on EI.
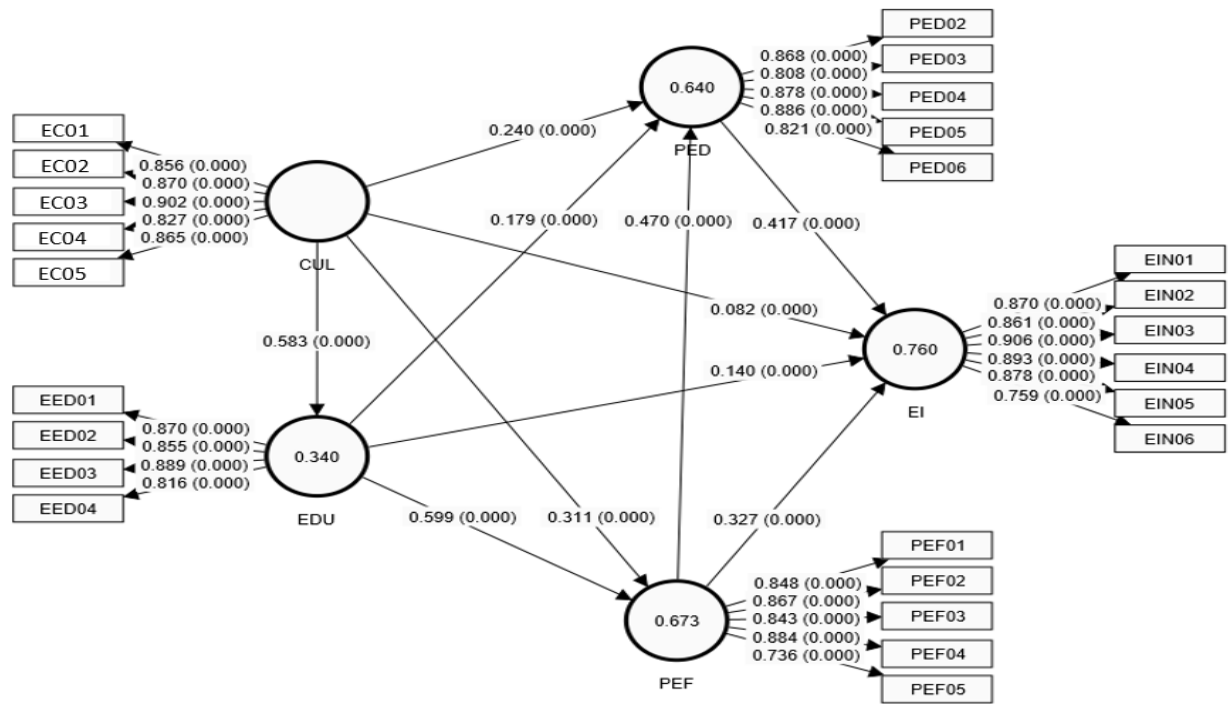
**Fig. 2.** Research model

**Discussion**

Overall, the research achieved some outstanding results, showing that the more positive the entrepreneurship culture and entrepreneurship education programmes for students are, the more they have an increased awareness of their desire to implement and the feasibility of startup projects, thereby increasing their intention to start a business.

More specifically, the perception of desirability (p = 0.000, beta = 0.417) and the perception of feasibility positively affect students' entrepreneurial intention (p = 0.000, beta = 0.327). This result shows that the more students perceive the project's feasibility, the more they increase their intention to start a business. According to Shapero and Sokol (1982), an individual with potential entrepreneurial intention must have the desire and perceive the feasibility of starting a business. This result is confirmed and consistent with the previous research results of Ayalew and Zeleke (2018). This is also suitable for the practical context of a startup project because the feasibility of a startup project includes financial feasibility, operational feasibility, and overall planning feasibility. All aspects must be guaranteed to help students reduce their perception of risks when starting a business because students have limited finances and resources compared with other social groups. Similarly, Cui et al. (2019) identified that entrepreneurial intention is shaped by the entrepreneurial mindset. Besides, awareness of desire is a factor that has a positive impact on students' intention to start a business. When the perception of feasibility is guaranteed, students will be aware of the desire to start a business career and firmly intend to start a business. This result is confirmed and supported by Krueger et al. (2000). The research results also reaffirm the relationship between perceived feasibility and perceived desire to start a business (p = 0.000, beta = 0.470). This result shows that, besides the direct impact of perceived feasibility and perceived desire to start a business on students' entrepreneurial intention, the influence of perceived feasibility can occur indirectly by promoting awareness of the desire to start a business based on the perception of project feasibility as a foundation to shape students' startup intention. This result is also consistent with the research Cui et al. (2019), Gibb (2002), Haynie et al. (2010), and Winkler (2014). According to Shapero and Sokol (1982), entrepreneurial intention relies on the conscious desire perception, action tendency, and perceived feasibility of the potential entrepreneur. The perceived entrepreneurial desire pertains to the extent to which an individual feels drawn to pursuing entrepreneurship and reflects personal preferences related to entrepreneurial behavior. If the perception of starting a business is that it is not feasible or the feasibility is low, it may need to become more attractive for individuals to start or wish to start a business.

The research results show that both startup culture and entrepreneurship education positively affect students' perceived feasibility and desire to start a business. Startup culture exerts a positive impact on students' entrepreneurial intention (p = 0.000 and beta = 0.082). Startup culture positively affects perceived feasibility (p = 0.000 and beta = 0.311) and perceived desire to start a business (p = 0.000 and beta = 0.240). This shows that startup culture, in addition to directly affecting startup intention, has an indirect impact through awareness of feasibility and desire to start a business. This result is consistent with much of the work by Martin, McNally, and Kay (2013) and Wibowo et al. (2018). The results of this study are consistent with Bandura's (2001) social cognitive theory (SCT), which suggests interactions between cognitive variables, environmental factors, culture, and individual behaviour. Referring to social cognitive theory, perceived feasibility and desire to start a business are two personal cognitive variables influenced by startup culture and startup education. Similarly, Jabeen et al. (2017) and Shepherd et al. (2010) confirmed that startup culture actively encourages individuals to learn and improve their knowledge and entrepreneurial mindset. Cui et al. (2019) and Mathisen and Arnulf (2013) also concluded that entrepreneurial thinking can be influenced and learned through an individual's initial knowledge and interaction with today's culture and circumstances.

Entrepreneurship education has a positive impact on students' entrepreneurial intention (p = 0.000 and beta = 0.140); it also has a positive impact on perceived feasibility (p = 0.000 and beta = 0.599) and perceived desire to start a business (p = 0.000 and beta = 0.179). This shows that entrepreneurship education, in addition to having a direct impact on the intention to start a business, has an indirect impact through awareness of feasibility and awareness of the desire to start a business. This result is supported by the study by Wardana et al. (2020), who commented that entrepreneurship education can promote students' entrepreneurial intentions. This result shows that entrepreneurship education inspires and develops students' motivation to choose entrepreneurship as a career choice through the learning process and practical experience of business activities and starting a business at school. Ridley et al. (2017) also explained that entrepreneurial cognition includes an individual's ability to make decisions in uncertain situations. Learning methods and practical, experiential activities are likely to have a direct impact on improving the cognitive abilities of university students, helping them to participate actively in entrepreneurial activities (Bogatyreva et al., 2019; Dehghani et al., 2018; Solesvik et al., 2013). This result also shows that entrepreneurship education helps to improve a student's capacity, influencing their intention to start a business. In other words, training and developing entrepreneurial capacity for students, when they are fully equipped with the necessary knowledge and skills and can recognize these capacities of their own, can motivate them to start more businesses. This result shows that, for students, the intention to start a business will be strongly motivated by both sides: the students themselves build their capacity through training and the specific feasibility. The nature of each startup project determines the intention to start a business.

Ultimately, startup culture significantly and positively impacts entrepreneurship education (p = 0.000 and beta = 0.583). This outcome indicates a favorable connection between entrepreneurial culture and education. One plausible explanation for this discovery is that entrepreneurial culture fosters social legitimacy and creates an environment conducive to teaching and learning in entrepreneurship. Moreover, the values embedded in entrepreneurial culture influence psychological attitudes toward entrepreneurship education. A positive culture surrounding entrepreneurship at the university level motivates students to be more receptive to new information and knowledge. This study underscores that universities play a crucial role in encouraging students to cultivate innovative ideas, fostering entrepreneurship as a viable career alternative, and equipping them with the knowledge necessary for business competence. The structured and curriculum-supported nature of entrepreneurial education enhances business awareness and directs learning toward practical preparation. This finding is reinforced by several previous researchers, such as Adekiya and Ibrahim (2016), Farny et al. (2016), and Khalid et al. (2019).

The study implies that educational interventions are crucial in shaping entrepreneurial perceptions and intentions. Institutions may consider incorporating real-world experiences, case studies, and mentorship programmes to enhance the effectiveness of entrepreneurship education. Understanding the impact of culture on entrepreneurship intentions provides valuable insights for policymakers. Strategies to promote a favourable entrepreneurship culture, through targeted awareness campaigns or community engagement, could be explored. Policymakers can use the

study's findings to inform policies aimed at promoting entrepreneurship. This may include designing initiatives that enhance the cultural aspects influencing entrepreneurial intentions.

## 6. Conclusion and implication

The study successfully achieved its objective by exploring the impact of culture and education on students' entrepreneurial intentions through an assessment of the perceived feasibility and desirability of entrepreneurship. The research results indicate that, as the cultural and educational environment increasingly supports entrepreneurial activities, there is a corresponding increase in students' awareness of the desirability and feasibility of entrepreneurial projects, consequently leading to a greater intention to engage in entrepreneurship.

This suggests that educational institutions, particularly universities, should focus on educating and training students in areas such as resilience in the face of challenges, willingness to be tested, and courage to accept risks. Entrepreneurship training programmes, labelled as "Business Startup ..." should be designed to cater to students across various disciplines and not limited to those studying economics. Additionally, universities must clearly define entrepreneurship education, emphasizing the transmission not only of knowledge, skills, and business experience but also of enthusiasm, passion, and a creative and entrepreneurial mindset.

The study implies the need for a faculty with practical experience of business management to create a supportive environment for the development of individual capabilities, effective student learning support, and a place that inspires the entrepreneurial spirit of young people. For students, before embarking on entrepreneurship, it is crucial to build motivation by recognizing the attractiveness of entrepreneurial opportunities, self-assessing entrepreneurial capabilities, and forming ideas and intentions for entrepreneurship, driven by passion. Successful entrepreneurs, apart from motivation, ambition, willpower, and perseverance in developing business ideas, have to face many difficulties and challenges and be willing to accept failure.

**Availability of supporting data**
Please contact authors for data and program codes requests.
**Competing interests**
The authors declare that they have no competing interests.

**Authors' contributions**
Methodology, Writing – original draft. AVT: Writing – review & editing, MNBL: Software, Data curation; HCC: Conceptualization, Project administration.

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**European Journal of Contemporary Education**

ELECTRONIC JOURNAL

# Formation of the Future Teacher's Readiness for Project Activities based on the Educational Resource of the Innovative Infrastructure of Pedagogical Universities

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**Abstract**

The article is devoted to an urgent and largely new problem for Russian pedagogical education – the organization of project-based activities of future teachers using a specially created innovative infrastructure. Currently, multifunctional innovative infrastructures are being introduced to pedagogical universities virtually everywhere. The subject of the study is the organization of the process of formation of future teachers' readiness for project management, taking into account the specifics and educational opportunities of the innovative infrastructure. The initial basis for solving the problem is the substantiation of the competence structure of readiness for project activities in a set of key competencies of priority areas of professional training: project development; organization and methodological support of project work of schoolchildren; self-development by a future teacher of readiness for project activities. An expert assessment of the effectiveness of the subject-based learning and innovation infrastructure according to these priorities shows that the organization of the process of forming readiness for project activities faces problems of interdisciplinary integration and professional self-development of students. The paper shows that the solution to these problems involves the coordination of subject-based learning and innovation infrastructure using, firstly, an adequate logical and substantive basis for building interdisciplinary integration in each priority area, and secondly, group reflection on already completed project activities with an emphasis on the deficits of the competence structure of readiness for project-based activities.

**Keywords:** teacher's project activity, innovative infrastructure of a pedagogical university, competence structure of readiness for project-based activity, coordination of processes of formation of readiness for project activity, interdisciplinary integration, reflexive reconstruction of project activity.

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## 1. Introduction

The interest expressed to the problems of pedagogical design on the part of researchers and practical teachers is extremely high today. And this is not accidental. The most diverse pedagogical projects are actualized by complex processes of updating the socio-cultural sphere and regionalization of education, tasks of innovative development and modernization of educational organizations. The number of teachers and entire teaching teams engaged in innovation is constantly growing, which is directly related to pedagogical design. All this indicates that the quality of general education and the effectiveness of methodological tools for organizing project activities of schoolchildren are increasingly dependent on the readiness of teachers to plan and design projects.

Currently, significant results have been achieved in this area: the main tasks and content of the stages of pedagogical design have been identified (Beckett, 2002; Zhirkova, 2014; Kolesnikova, Gorchakova-Sibirskaya, 2005; Lazarev, Moskvin, 2019), the functions and potential of interdisciplinary interactions in the formation of teachers' readiness for project activities have been revealed (Busy`gina, Saraeva, 2011; González-Carrasco et al., 2016; Lazarev, Moskvin, 2019), the pedagogical conditions of the interrelation of project activities with other types of activities within the framework of teacher training of a particular profile are substantiated (Blomsø et al., 2023; Raeva, Asadullin, 2022), ways of including pedagogical projects and their fragments in the content of academic disciplines of various cycles are identified (Abramovskix, Smolenskaya, 2024; Knyaz`kova, 2013; Coleman, 1992), the consolidating capacity of collective project-based activity for the formation of a community in the field of teacher education are revealed (Jakhelln, Postholm, 2022), the methodological aspects of the process of motivating pedagogical planning and design in solving pedagogical problems are shown (Petra et al., 2017), etc.

At the same time, many key problems remain unresolved, including the problems of using the potential of the innovative infrastructure of pedagogical institutions (hereinafter referred to as the innovative infrastructure) to organize students' project-based activities in order to form and develop their professional competencies.

Currently, the innovative infrastructure based on pedagogical universities is used in various thematic areas of project-based activity: Moscow Pedagogical State University – Technomir (Pedagogicheskij..., 2024); Bashkir State Pedagogical University named after M. Akmulla – conducting the course "VR Development Technologies on the Varwin platform" (Texnopark..., 2024a); Novosibirsk State Pedagogical University – media polygon "Gamejam: Gaming practice in action": the development of media education and gamification (Texnopark..., 2024b); Ulyanovsk State Pedagogical University – development of theoretical, methodological and scientific methodological support for the processes of identifying and reducing professional and psychological deficits of a teacher using VR technologies (Texnopark..., 2024c), etc.

Despite its seemingly informal status, innovative infrastructure is an important part of the professional training of a future teacher and, with proper planning and organization, performs significant educational functions:

(1) expansion and consolidation of professional and pedagogical knowledge and skills in accordance with universal, general professional competencies in accordance with the requirements of the Federal State Educational Standard of Higher Education for such educational areas as 44.03.01 and 44.04.01 "Pedagogical education", 44.03.05 "Pedagogical education (with two training profiles)";

(2) systematization and structuring of project knowledge and skills in the experience of conceptual modeling of project-based activities and independent implementation of projects in the field of vocational education;

(3) creating conditions for mastering the functional-and-role content of project activities, which is fundamentally important for collective problem solving, including involving students and teachers from educational organizations;

(4) expanding the space for business and creative cooperation with researchers, teachers, practitioners, heads of educational organizations in the process of implementing various projects.

Many researchers point out to similar possibilities of the innovative infrastructure of a pedagogical university (Ryabova, 2012; Fomikh, 2023, etc.).

The most urgent problems of studying the educational resource of innovative infrastructure should, first of all, include the socio-cultural and vocational educational status of this kind of infrastructure; regulatory parameters of the innovative infrastructure of pedagogical universities

and priority directions of its development; approaches to modeling and forecasting of innovative infrastructure; conceptual foundations for the organization of project activities of future teachers; principles and conditions for the organization of joint activities future teachers and students in the implementation of projects; systematics of thematic clusters of design; modular structuring of clusters of project activities; meaningful content of clusters and cluster modules of project activities, etc.

In order to achieve a generalized understanding of the role and specifics of project activities in the training of future teachers based on the innovative infrastructure of a pedagogical university, it is necessary:

– First, to determine what constitutes a teacher's readiness for project activities, on which key professional competencies it relies;

– Secondly, to assess the interdisciplinary potential of the educational process and the possible contribution of innovative infrastructure to the formation and development of the future teacher's readiness for project activities. Note that without solving this problem, it is impossible to decide in which part of the implementation of certain projects can students rely on the potential of the educational process, and in which part can they rely on the potential of the innovative infrastructure.

## 2. Methodology

The research methodology is aimed at identifying the organizational foundations of the unity of two components of the process of professional training of future teachers for project activities – subject-based training within the framework of the higher pedagogical education program and the innovative infrastructure of a pedagogical university, taking into account its specifics and resource capabilities. The essence of the issue is, first of all, to identify the goal-functional setting of preparation for project activities (competence approach, method of value-semantic specification), the reduction of which allows one to assess the effectiveness of training in priority areas (the method of expert assessments), and then to carry out consistent coordination of various parts of the educational process (the method of conceptual modeling). The practical implementation of the planned approach is regulated based on specially developed logical and substantive foundations of interdisciplinary integration and a system of reflexive situations aimed at critical analysis and meaningful generalization of all stages of the completed project in the context of the tasks of professional training of a future teacher (integrative approach, method of decomposition and modeling of complex systems).

## 3. Discussion

Let's turn out attention to the category of readiness for practical activity. This category has a detailed argumentation as a value-oriented orientation of professional training of a modern teacher (Tyunnikov, 2013). Let's take notes of the main aspects.

Usually, goal-setting in the vocational education system occurs in the range of such concepts as professional competence, professional abilities, professional qualifications, professional mobility, motivation for innovation, the ability to make responsible decisions, professional knowledge, skills, and abilities. It is these concepts that can most often be found in the formulations of the target orientation of educational programs for the professional training of future teachers adopted today.

However, if we consider goal-setting from the perspective of socio-pedagogical requirements (requirements of social necessity and pedagogical expediency), then we should turn to the category of professional pedagogical readiness. This should be done, first of all, because the readiness of a modern teacher is actually a derivative of all the above-mentioned professional qualities. Consequently, in the general case, professional and pedagogical readiness appears as a set of basic (universal) and auxiliary competencies.

Researchers consider readiness as a complex holistic education, a dynamic phenomenon determined by internal and external factors; as a system of integrated structural components. In psychological and pedagogical works, there are two main approaches to understanding the structure of readiness: functional and personal. From the point of view of the functional approach (A.G. Kovalev, N.D. Levitov, V.A. etc) Readiness is defined as the pre-start activation of mental functions, and its structure correlates with the structure of a certain type of activity, including cognitive, emotional, motivational and volitional components. From the standpoint of a personal approach (V.A. Krutetsky, A.I. Shcherbakov, V.A. Slastenin, V.V. Stolin, etc.) readiness is

considered as the presence of personal prerequisites for the effective implementation of a certain activity, and its structure correlates with the structure of personality, including motivational, orientation, operational, volitional, evaluative, moral components.

Without departing far from the interpretations proposed by representatives of the personal approach, we will understand by the professional and pedagogical readiness of a teacher for project activity a certain synthesis of professionally significant abilities and needs that determine the quality of his professional functions. Readiness for design should be considered as a structural component of a teacher's qualification and, consequently, to form it in an independent status as a key factor of his socio-professional stability.

Currently, the curricula of the pedagogical bachelor's degree programs in the areas 44.03.01 "Pedagogical Education", 44.03.05 "Pedagogical education (with two training profiles")" implemented by pedagogical universities include the module "Educational research and project activities" (15+ credits), focused on the formation of students' readiness for pedagogical design. The master's degree programs in the field of training 44.04.01 "Pedagogical education" include the discipline "Designing educational programs in educational organizations of various types". Obviously, such disciplines (modules) of project content, especially at the initial stage of pedagogical education, play a significant role in the professional development of a future teacher.

At the same time, it is well-known that the formation of such a complex quality among students, such as professional and pedagogical readiness for project activities, cannot be limited only to the scope of tasks of individual disciplines or modules. To achieve the desired result, a specially organized structure of interdisciplinary integration is required. The main feature of such integration is that it should be based on a very specific logical and substantive basis and solve the tasks set at the proper level. Finding such a logical and meaningful basis is complicated by the fact that project activities and readiness for them have multiple characteristics.

It seems to us that the task of determining the logic and content of interdisciplinary integration should not be set at the level of an exhaustive enumeration of specific characteristics of readiness for project activities, but, above all, at the level of holistic personal and activity structures, which are professional competencies. And further, based on the substantive characteristics of specific professional competencies, consider them as the main units of interdisciplinary integration. Moreover, it is necessary to do this taking into account the interdisciplinary resource and subject learning, and the innovative infrastructure of the pedagogical university.

The structural and functional analysis of the teacher's professional and pedagogical readiness for project activity allows us to talk about three main forms of its practical implementation:

(1) project development (first of all, these are pedagogical projects related to the development of a system of pedagogical goals, the content of educational programs, educational technologies for a given purpose, teaching tools and pedagogical diagnostics, etc.);

(2) organization and methodological support of the project work of students of secondary schools;

(3) self-development of professional and pedagogical readiness for project activities.

Therefore, in the competence structure of a teacher's readiness for project activities, it is necessary to distinguish three relatively independent groups of professional competencies (PCs):

– PCs of a design and technological nature that ensure the development of projects;

– PCs of a didactic and methodological nature that ensure the construction and organization of project-based education for schoolchildren;

– Self-educational PCs that ensure self-development of readiness for project activities.

This distinction is prompted by the fact that the PCs of each group have distinctive professional functionality and their own logic in terms of practical implementation, which means that they have different effects on the professional and personal development of the future teacher. In particular, the activity of a teacher in organizing the project activities of schoolchildren involves special work to transfer them to the position of the subject of cognition, work and communication. This, in turn, involves teaching students how to plan project activities based on interdisciplinary interrelation, setting goals, organizing individual design stages, and evaluating the results obtained. Communication and exchange of experience with other design participants is also important. The very fact of the "dialogical" content of the project activity presupposes the active interaction of all project participants. Separately, it should be said about the PCs related to the reflection of the process and the result of project activities, which creates the necessary

prerequisites for the process of mutual development and self-development of each participant in the project.

Let's observe the competence structure of the teacher's readiness for project activities:

*The first group includes PCs 1-5:*
– PCs-1: mastery of the skills of value-semantic definition of project activities;
– PCs-2: knowledge of the information basis for project activities;
– PCs-3: knowledge of the operational basis for project activities;
– PCs-4: mastery of communication skills in project activities;
– PCs-5: proficiency in diagnosis of project activities.

*The second group includes PCs 6-10:*
– PCs-6: proficiency in modeling project activities;
– PCs-7: knowledge of project management organization;
– PCs-8: mastery of project management regulation;
– PCs-9: knowledge of project activity motivation;
– PCs-10: mastery of the skills of monitoring and evaluating project activities.

*The third group consists of PCs 11-12:*
– PCs-11: mastery of reflection of project activity;
–PCs-12: mastery of self-development skills of readiness for project activities.

The competence structure of readiness for project activities is formed, on the one hand, due to the very specific relationship of design procedures with other procedures for training future teachers and, above all, with the methodology of school education, and on the other, due to their figurative and conceptual reflection in the form of situations and scenarios that are fixed in professional pedagogical experience and the experience of professional self-development. At the same time, each direction of the formed readiness is based on its characteristic interdisciplinary integration, which is mastered in a logically ordered set of knowledge and operations.

The 1st priority is project development. This direction is designed to form students' design and technological PCs. The logical and substantive basis of interdisciplinary integration is project activity, its informational and operational content: functional and role positions, external and internal determinations, structure and content, methodology of organization and execution, methods and forms of design. It is important not only to put the necessary elements of project activity into professional training, but also to establish significant relationships between them. Depending on the tasks set and the problems that arise, the project activity describes the projected reality in three key meanings: the object of analysis, the object of modernization, and the object of management.

The projected reality is considered as an object of analysis in the characteristics of socio-cultural strategizing and, in this regard, from the standpoint of the socio-cultural significance of the readiness of a modern teacher for project activities. Interdisciplinary integration in this case forms practical and technological PCs for the future teacher with an emphasis on revealing the essential aspects of the design object, demonstrating its role and place in the system of professional functions, familiarization with the problems of predictive evaluation of design ideas and solutions.

An important feature of the projected reality as an object of modernization is that a constructive principle is introduced into it, aimed at its modeling and transformation, taking into account the peculiarities of external and internal factors. The PCs group being formed is directly related to the practical tasks of project activity and, consequently, to its informational and operational basis, including conceptual guidelines, methodological principles, empirical description of internal and external factors, analytical, search and design schemes, methods and techniques for upgrading various facilities.

As an object of management, the projected reality reveals itself in the characteristics of planning, organization, control and development according to its changes over time. At the same time, the integrative interactions of subject-based learning, pedagogical practices and research work of students focus on the formation of practical and technological PCs, taking into account the problems of project development management.

The 2nd priority is the organization and methodological support of the project work of schoolchildren. The interdisciplinary process of formation of didactic and methodological PCs is being developed on the logical and substantive basis of pedagogical activities for the organization and methodological support of project activities of schoolchildren. And there is a significant difference here. Project activity is considered pedagogical as an object of didactic and methodological implementation. In this case, interdisciplinary integration changes its perspective,

since the main thing is to demonstrate the features of the practical use of project activities for pedagogical purposes, in educational, methodological and logistical resources necessary to obtain the required pedagogical result. The purposeful formulation and solution of the tasks of organizing and teaching students project activities involves the creation of the necessary conditions for the development of professional readiness of future teachers in a methodological sense.

The 3rd priority is self-development of readiness for project activities. This direction is designed to form students' self-educational PCs. The logical and meaningful basis of interdisciplinary integration in this case is the reflective activity of students, centered on the process and results of a previously completed project. The tasks of professional self-development close the process of forming a future teacher's readiness for project activities. With proper organization, this area performs an important structure-forming function in coordinating PCs with each other. PCs for project development and PCs for organizing project activities of schoolchildren are complemented by PCs for self-development of readiness for project activities precisely in the key of the integrity of the formed readiness. In particular, the information obtained during self-analysis allows students to draw more reasonable conclusions about possible gaps in their project activities and plan further steps to overcome them. In the process of purposeful self-education, the content of preparation for project activities appears as a system of knowledge and actions that is methodologically enriched with methods of introspection and self-control.

What are the characteristic features of the process of forming readiness for project activities in the context of subject-based learning and in the context of innovative infrastructure?

In subject-based learning, the logic of forming students' professional and pedagogical readiness for project activities is based on the principle of "from part to whole", in other words, from individual elements of the PCs to the integral structure of professional and pedagogical readiness for project activities. In order for academic disciplines to merge into a single content, they must have a common object of formation, including its specific properties, functions, mechanisms, patterns, etc.

In the context of an innovative infrastructure, the logic of formation and development of readiness for project activities is fundamentally different here – "from the whole to the part", since students from the very beginning, as they say, from the first steps of immersion in the project get a fairly complete idea of what information and operational elements of project activities are necessary for successful work on the project. In this case, the processes of formation of didactic-methodical and self-educational PCs are superimposed on the logic "from the whole to the part".

It should be noted that, obviously, in this case, junior and senior students will be in completely different conditions when working with the project. This circumstance must be taken into account when organizing methodological support for project activities.

In order to identify and analyze the impact of the subject-based learning system and the impact of innovative infrastructure on the process of forming students' readiness for project activities, it is necessary, first of all, to assess the level of formation of those PCs that are necessary for the implementation of this readiness. To do this, it is necessary to develop a logical and semantic construct that establishes dependencies between professional competencies and functional signs of the formed readiness. Each such dependence reveals the readiness for project activity in a certain aspect, from the most significant side for solving a particular practical task (Figure 1).
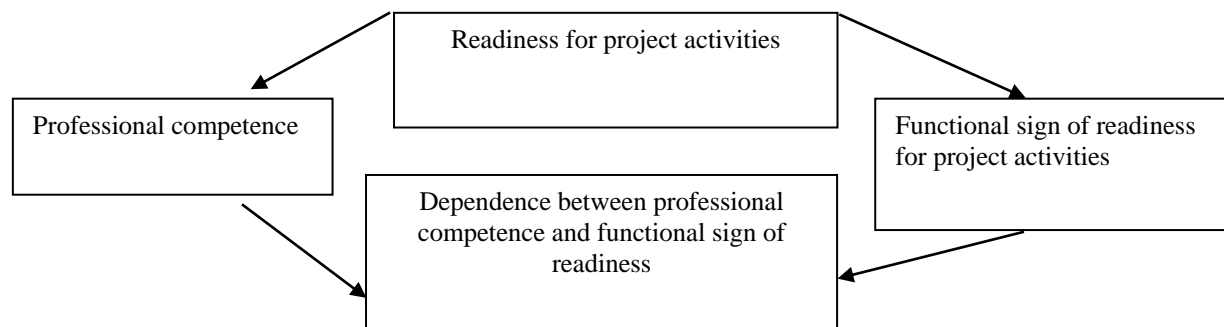


**Fig. 1.** Logical-semantic construct for diagnosing the competency structure of readiness for project activities

An important feature of the logical and semantic construct should be emphasized. The selection of the most significant essential feature allows not only to reduce the overall set of PCs characteristics and thereby avoid undesirable redundancy when considering them, but also significantly simplify the procedure of the analysis.

Here are the dependencies between the PCs and the essential signs of professional and pedagogical readiness, which, in our opinion, are crucial for assessing the impact of the subject-based learning system and the impact of the innovative structure of a pedagogical university on the training of future teachers in this field.

*Dependencies of the first group of PCs:*

– mastery of the skills of value-semantic definition of project activity – building the concept of project activity;

– knowledge of the information basis of project activities – a systematic description of the project object;

– knowledge of the operational basis of project activity – transformation of the project object;

– mastery of communication skills of project activities – exchange of experience in project activities;

– knowledge of diagnostic skills of project activities – assessment of the quality and result of project activities.

*Dependencies of the second group of PCs:*

– mastery in modeling project activities – definition of the logical structure of project activities;

– mastery in the organization of project activities – organization of teamwork;

– mastery of the skills of regulating project activities – creating an atmosphere of collective creativity;

– knowledge of project activity motivation skills – stimulation of project activity;

– proficiency in the control and evaluation of project activities – identification of barriers to project activities.

*Dependencies of the third group of PCs:*

– mastery of the skills of reflection of project activities – generalization of the results of self-reflection of project activities;

– mastery of self–development skills of readiness for project activities – determining the priorities of professional self-development.

**4. Results**

As an illustration, we present the results of an expert assessment of the competence structure of the readiness of future teachers for project activities, obtained in pedagogical universities of 9 territories of the Russian Federation (Altai Region, Amur Region, Volgograd Region, Krasnoyarsk Territory, Moscow, Sverdlovsk Region, Tula Region, Chechen Republic, Yaroslavl Region) (Table 1 and Figure 2). The selection of experts is carried out according to the methodological recommendations (Cherepanov, 2006). The expert assessment is performed on a 6-point scale in the range of values from 0.0 to 5.0. The results of the examination of the potential of the subject-based learning system and the potential of the innovative infrastructure of the pedagogical university are reflected in the petal diagram. The obtained results of the expert assessment, in our opinion, allow us to conduct a comparative analysis of the extent to which students' readiness for project activities is formed through the integration of subject-based learning, and to what extent through the resources of the innovative infrastructure of the pedagogical university, and in this regard to talk about their specifics, as well as about the work that needs to be done to eliminate the gaps.

**Table 1.** Results of an expert assessment of the competency structure of future teachers' readiness for project activities

| Level of Professional Competences formation | Professional competencies in the structure of students' readiness for project activities | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCs 1 | PCs 2 | PCs 3 | PCs 4 | PCs 5 | PCs 6 | PCs 7 | PCs 8 | PCs 9 | PCs 10 | PCs 11 | PCs 12 |

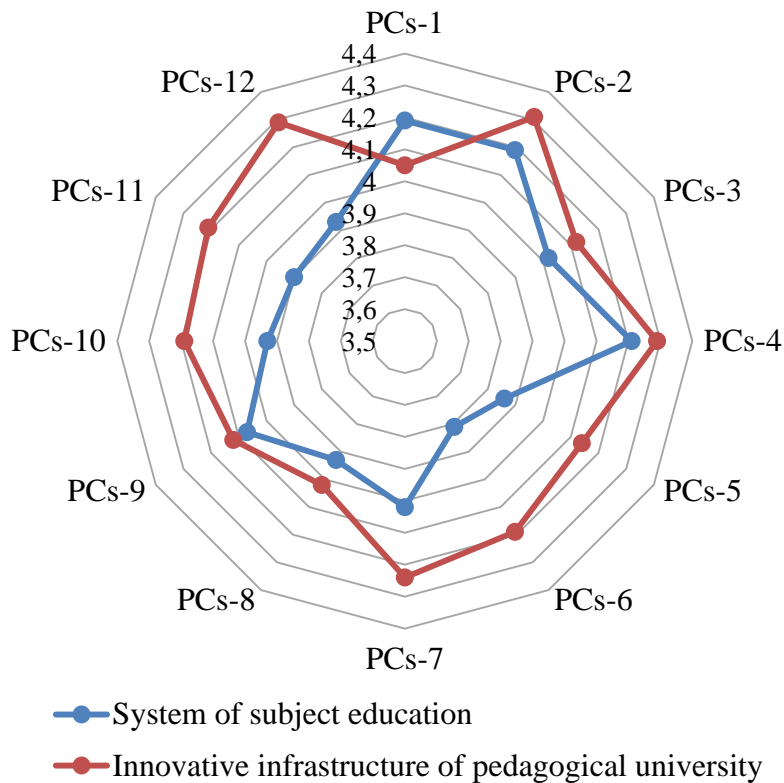| Level of PC formation in subject training | 4,19 | 4,19 | 4,02 | 4,21 | 3,86 | 3,81 | 4,02 | 3,93 | 4,07 | 3,93 | 3,90 | 3,93 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Level of PC formation in the innovation infrastructure pedagogical university | 4,05 | 4,31 | 4,12 | 4,29 | 4,14 | 4,19 | 4,24 | 4,02 | 4,12 | 4,19 | 4,21 | 4,29 |



**Fig. 2.** Diagram of the influence of Professional Competences on the readiness of a future teacher to project activities in the conditions of subject teaching and in the conditions of the innovative infrastructure of a pedagogical university

The first thing that attracts attention is the problem of interdisciplinary integration, since there is a certain gap between the PCs being formed.

We are talking about the gaps of design-technological, didactic-methodological and self-educational PCs in the competence structure of project activities. Expert assessments show that the previously mentioned modules and disciplines on pedagogical design and, in general, interdisciplinary integration currently do not adequately ensure the formation of professional and pedagogical experience in project activities. First of all, this concerns design and technological elements and elements of conceptual representation of situations and design scenarios (for subject-based learning PCs-3, PCs-5, respectively, $d_3 = 4.02$, $d_5 = 3.86$; for innovative infrastructure PCs-3, PCs-5, respectively, $d^i_3 = 4.12$, $d^i_5 = 4.14$). In this regard, it should be noted that for a future teacher, it is not the methodology and technology of project activity in general that are important, but specific procedures, methods and techniques that can be used in their practical work. Of course, the established educational practice has a negative impact on the motivational and target orientation of project activities, algorithms and heuristic mechanisms for modeling socio-cultural and psychological-pedagogical reality. Experts note the low level of formation of didactic and methodological PCs related to the organization and modeling of project activities of schoolchildren (for subject learning PCs-6, PCs-8 and PCs-10, respectively, $d_6 = 3.81$, $d_8 = 3.93$ and $d_{10} = 3.93$; for innovative infrastructure PCs-8, PCs-9, respectively, $d^i_8 = 4.02$ и $d^i_9 = 4.12$).

Another central problem is the gap in the level of formation of those PCs on which the self–development of students' professional and pedagogical readiness for project activities depends (for subject-based learning, PCs -11, PCs -12, respectively, $d^i1 = 3.90$, $d^i2 = 3.93$; for innovative infrastructure, PCs-11, PCs-12, respectively, $d^i11 = 4.21$, $d^i12 = 4.29$). In this regard, it can be concluded that in the context of subject-based education, targeted work in this area of professional training is not carried out with enough efficiency.

Thus, the task of additional coordination of subject-based education with innovative infrastructure is put on the agenda. To solve this task, it is necessary to supplement the organization of project activities with special procedures that optimize interdisciplinary integration, primarily for those PCs that, due to low formation, prevent the transition of readiness for project activities to a new level of development. In this case, semantic configurations are used in each individual step of the design solution with internal support for integral units of interdisciplinary interconnection.

At the same time, it is necessary to create conditions for thorough self-analysis and self-assessment by students of the experience they have already acquired. We are talking about a system of reflexive situations for the reconstruction of a previously completed design. Interacting with each other, like Lego blocks, such situations form semantic structures that restore the logic and content of not only individual stages or fragments of project activity, but also the entire design process in a characteristic set of applied knowledge and skills. Moreover, this is done directly under the conditions of an innovative infrastructure in the form of group reflection and by means of meaningful generalization, which serves as an important prerequisite for overcoming those gaps in the PCs that have a low level of formation. As our research shows, it is necessary to include in the set of reflexive situations:

– the situation of re-actualization of project activities. In this situation, students' reflection is focused on evaluating and analyzing the significance of the project. It is necessary to turn once again to the relevance of the project and restore the procedures by which the trends and factors influencing its choice (pedagogical, psychological, socio-cultural, economic, technological, etc.) were determined;

– the situation of restructuring project activities. Students' reflection in this situation is directed to self-assessment of the implementation of individual stages of the project; to self-assessment of the experience of owning a set of principles, methods and algorithms for organizing and methodological support of students' work on projects;

– the situation of reintegration of project activities. In a situation of reintegration, students recover and evaluate specific actions that are directly relevant to determining the interdisciplinary content of individual design stages. Students give a detailed self-assessment of how to develop a project based on the interrelation of various disciplines, ways of interdisciplinary integration in modeling and methodological support of project activities of schoolchildren;

– the situation of reception of readiness for project activities. The focus of the situation is on the knowledge and skills of students necessary to increase the effectiveness of design-technological, didactic-modeling, methodological and self-educational PCs.

We present the centralization of reflexive situations to fill the gaps in the competence structure of readiness for project activities in order to organize students' work on professional self-development (Table 2).

**Table 2.** The focus of reflexive situations to overcome gaps in the competence structure of readiness for project activities (based on the results of an expert assessment of pedagogical universities of 9 territories of the Russian Federation (Altai Region, Amur Region, Volgograd Region, Krasnoyarsk Territory, Moscow, Sverdlovsk Region, Tula Region, Chechen Republic, Yaroslavl Region)

| Composition of reflexive situations in the logic of reconstruction of project activities | Focus of reflexive situations on overcoming gaps in the competence structure of readiness for project activities | | |
|---|---|---|---|
| | Focus on design and technological PCs | Focus on didactic and methodological PCs | Focus on self-educational PCs |

| situation of re-actualization of project activities | PCs-1 | PCs-6, PCs-8, PCs-10 | PCs-11 |
|---|---|---|---|
| situation of restructuring project activities | PCs-3, PCs-5 | PCs-8, PCs-9 | PCs-11 |
| situation of project activity reintegration | PCs-3, PCs-5 | PCs-8, PCs-9 | PCs-12 |
| situation of reception of readiness for project activities | PCs-3, PCs-5 | PCs-8, PCs-9 | PCs-12 |

Work on the reconstruction of previously completed project activities is organized in the form of group reflection with the involvement of all project participants (students, professional researchers, teachers and students of educational organizations, etc.). During the group discussion, students summarize the methods of project activity at all stages of project work, develop the ability to analyze and evaluate their own actions and the actions of other project participants. At the same time, individual and group reflection processes merge, since work takes place with each participant individually and with the group as a whole.

### 5. Conclusion

The above-mentioned ideas allow us to draw certain conclusions. In the competence structure of the readiness of future teachers for project activities, there are significant gaps in the PCs of a design-technological, didactic-methodological and self-educational nature. The main reason for low indicators is that of the full set of tasks of professional training of students for project activities, only those tasks that are directly related to the practice of developing the projects themselves are more or less successfully implemented. An important prerequisite for overcoming these shortcomings is the design and organizational coordination of the tasks of interdisciplinary integration, implemented in the context of subject-based learning and in the context of the innovative infrastructure of a pedagogical university. It is necessary to do this, first of all, due to a certain coordination of educational and organizational tasks in three priority areas of training future teachers for project activities – project development; organization and methodological support of project work of schoolchildren; self-development of readiness for project activities. The key importance for coordinating priorities among themselves is the adjustment of the process of forming the competence structure of readiness for project activities using an adequate logical and substantive basis for interdisciplinary integration, as well as the reconstruction of project activities in a special set of reflexive situations.

It is precisely this understanding of the resource capabilities of the innovative infrastructure of a pedagogical university and its relationship with the tasks of subject-based learning that seems to be the most adequate, since it sets the conditions under which the organization of project activities begins to function effectively and, therefore, can ensure the solution of the tasks set in a more complete manner.

### 6. Acknowledgements

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## The History of Education

## Initiative of Zemstvo Liberal Opposition in the Chernihiv Governorate to Educate Population in the 1870s

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**Abstract**

The article deals with policy of zemstvo liberal opposition in the Chernihiv Governorate to educate population. Some historical sources are first-ever used in research. From authors' perspective, the zemstvo liberal party of the Chernihiv Governorate possessed a firm and well-grounded policy to develop public education among local uezds, which was supported by corresponding legal acts. The historical analysis reflects the conceptual approach for the zemstvo liberal opposition to settle education as a relevant social issue. Firstly, a document was considered to define progressive initiatives and resource provision. Secondly, the paper was submitted to self-government authorities within the zemstvo liberal party of the Chernihiv Governorate. They argued and defended the considered ideas. Such an approach succeeded in an effective educational reforming by the zemstvo opposition.

**Keywords:** zemstvo liberal party, Chernihiv Governorate, zemstvo institutions, public education, educational policy, educational reform.

**1. Introduction**

History of the zemstvo liberal movement on Ukrainian north-east lands in the second part of the 19th century is topical and requires new study. In particular, that concerns the humanities policy. Education priorities of the Chernihiv Governorate are still not researched in detail.

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However, in one of our previous articles, we represented an education policy foundation laid by local zemstvo liberals in the second half of the 1860s (Kotelnitsky, 2023b). Therefore, the current article reveals the conceptual basis of education policy among zemstvo liverals of the Chernihiv Governorate in the 1870s.

## 2. Materials and methods

The article is based on protocols, regulations and records of zemstvo meetings in the Chernihiv Governorate. Such sources were taken from the Chernihiv State Archive, the V. Tarnovskyi Chernihiv Historical Museum and the Kyiv Central State Historical Archive. Some of sources are first-ever used in research.

The authors apply general scientific and special historical methods. The former deals with analysis and synthesis, deduction and induction, description. The latter comprises history comparison and problem chronology.

Analysis and synthesis defined the essence and relevance of historical events and processes in education development. Induction and deduction collected a set of empirical materials to explain research principles. Factual data provided theoretical statements while scientific conclusions were argued and illustrated with historical materials. The description method reviewed participation of zemstvo liberals in a large-scale education development within the Chernihiv Governorate in the 1870s.

History comparison determined the activities of local aristocratic opposition in the public education sphere with assessment of practical achievements. The problem chronology method produced a general idea of zemstvo liberal imperatives in public education (within its chronological sequence and logical completeness).

## 3. Discussion

First publications on zemstvo liberalism in the pre-revolution historiography emerged at the 20th century beginning. They reviewed respective main political events in the Russian Empire liberation (Belokonskij, 1910; Belokonskij, 1914; Veselovskij, 1905; Veselovskij, 1911).

Because of ideological and political reasons, the Soviet history science did not research the zemstvo liberal movement for a long time. It was only in the 1970s when fundamental investigations were conducted to analyze the opposition movement in terms of origin, ideological and social basis, policies and staff. Nevertheless, the Soviet historiography (like the pre-revolution one) was not aware of an urgent need to study different directions of this movement and subsequent branch policies (Itenberg, 1983; Katrenko, 1975; Petrov, 1976; Pirumova, 1977). Such limited publications remain relevant and define topicality among young historians.

With no solving enterily the above-mentioned issues, foreign researchers contributed significantly to studying philosophical paradigms of zemstvo liberalism and national composition of opposition movement (Morgun, 1969; Timberlake, 1972). After the Soviet Union collapse, Ukrainian and Russian historians started focusing on the zemstvo liberalism. However, in new ideological conditions, researchers confined themselves only to case study of opposition movement with no aim to analyze branch activities and respective policies (Katrenko, 1994; Katrenko, 2001; Mojsijenko, 1999; Red'kina, 2002; Sekirinskij, 1999).

Within the modern historiography, a detailed research of zemstvo liberalism in Northern Ukraine has been launched only recently.

As an example, we can mention works by S. Degtyarev, A. Ziakun, N. Kotelnitsky, A. Lebid (Kotelnitsky, 2020; Kotelnitsky, 2021; Kotelnitsky, Degtyarev, 2022; Kotelnitsky et al., 2022; Kotelnitsky, 2023a; Lebid, Kotelnitsky, 2022; Lebid et al., 2023). These publications were first to investigate clerical policies of zemstvo liberals, the 1864 zemstvo reform, the Jewish issue, the opposition role in female education, the Russian despotism repressions against local aristocratic oppositionists, the Ukrainian question importance for the liberal party itself.

Yet, humanitarian policies of the zemstvo liberal party in the Chernihiv Governorate still require detailed research of public education. Therefore, historiography of the Ukrainian zemstvo liberalism lacks for high-quality and substantial publications to provide the domestic historical science with new knowledge.

## 4. Results

The 1870s beginning was marked with revolutionary achievements of zemstro liberals for education policies. In January 1870, the Regulation on Teaching Seminary was drafted to unfold an institution in Chernihiv. The paper was prepared by local zemstvo authorities whose members were usually liberals. It was sent for consideration to all 15 zemstvos of the Chernihiv Governorate. Let us review the document content.

Since its founding, the Chernihiv Teaching Seminary was proclaimed a zemstvo institution exclusively. It had to be controlled by zemstvo authorities, funded via state budget and situated in a zemstvo building. It was mainly peasants who were going to study free of charge with personal scholarships from zemstvo authorities. Thus, a group of up to 50 students had to be selected. The institution supervision and inspection were a responsibility of zemstvo authority representatives. The seminary education course was three years. Annually, the institution was checked by the Public Education Ministry of the Russian Empire. The staff consisted of five zemstvo officials: a headmaster, three teachers and a technical worker.

The headmaster was elected by the Chenihiv Governorate zemstvo authorities among skilled persons with higher education. The decision was approved by the Kyiv Educational District. The same concerned elections of seminary teachers (with a requirement of higher or incomplete higher education). Secular teachers were approved by the Kyiv Educational District. Positions of religion educators were confirmed by the Chernihiv Governorate Episcopate. The headmaster was assigned and resigned via resolutions of the Kyiv Educational District. Employment of teachers were regulated by zemstvo authorities. To settle issues of strategic development of the teaching seminary, there was a consulting organization – the Seminary Board. Its participants were the headmaster, all teachers and a zemstvo authority representative.

The seminary admitted students above 16 years of age. They were referred by the Chernihiv Governorate zemstvos. Students from all governorate uezds had to be educated in equal proportions. Zemstvos provided their students with scholarships to cover their livelihood needs. Having finished the education course, graduates returned to their uezds for employment as elementary school teachers. To select the best seminary applicants, examinations were held for entrants. Students could also get education via commercial contarcts. The corresponding applications were submitted directly the Seminary Board. Unfortunately, the draft regulation did not provide for a dormitory. Students lived with relatives or rented accommodations in Chernihiv.

Seminary graduates were awarded with personal certificates from zemstvo authorities of the Chernihiv Governorate. Having been funded for study from zemstvo budgets, they had to work as school employees in local uezds for at least 3 years. Otherwise, graduates paid back 2,400 roubles, a full cost of money spent for their education (calculated as three annual scholarships of 800 roubles). If graduates had worked on such school positions for over 6 years, they got preferences from uezd institutions. For example, a 300-rouble commercial credit (recovered via 10-year installments) to satisfy personal needs and annual salary supplements up to 120 roubles.

Also, the document provided for annual salaries among the teaching seminary workers: headmaster – 1,500 roubles, religion teacher – 600 roubles, secular teachers – 2,000 roubles, music teacher – 100 roubles (ZCHZ, 1870, №5: 124-133). It is worth saying that the Chernihiv Teaching Seminary was unfolded in 1871 as a leading institution to train educators of elementary and public schools.

In September 1870, the Borzna Zemstvo Assembly adopted a draft reform to create an elementary education system. It was submitted for consideration by I. Petrunkevych, the leader of zemstvo liberals in Left-Bank Ukraine. The aim was to establish the Borzna Uezd School Fund for promoting elementary education. The idea was realized via taxation of each land tithe. Higher assets meant higher taxes. Also, money was deposited in banks. Such principles allowed the Chernihiv opposition to secure a regular income for the Borzna budget. These annual bank interests were used to create an elementary school in each uezd village. With 60 schools, the Borzna zemstvo was one of the most successful regions in the Chernihiv Governirate education. The progress lasted for many years while the uezd education itself functioned independently from that of other governorate communities (Kotelnitsky, 2012: 74-76).

Zemstvo liberals succeeded in future as well. On 26 April 1871, the special session of the Borzna Uezd Assembly considered a report of liberal opposition. It concerned the Draft Instructions for Zemstvo School Headmasters. The authors were zemstvo liberals M. Imshenetskyi and N. Volk-Karachevskyi. Let us analyze the act.

The instructions regarded zemstvo schools as free-of-charge educational intitutions for males and females of all social classes and confessions. Children studied from 9 years of age in the daytime. Illiterate adults could study from 16 years of age in winter evenings or on weekends and holidays during the whole year.

Both rural communities, volosts and private individuals could unfold elementary schools. The document offered to divide the Borzna Uezd into separate educational districts led by members of the teaching board from zemstvo institutions. These officials inspected district schools and accounted to the uezd assembly for education conditions. Each district school had an elected warden with inspecting duties.

The act made uezd authorities transfer tax and charge interests to the school fund. The money was converted into bank securities with the highest commercial profit. Alternatively, lands were bought for lease and subsequent income to the school fund. Via the collected money, local authorities and zemstvo officials were supposed to build one school annually in any uezd area. Allocated from the Borzna budget within education per year, 15,000 roubles were divided into two parts. 8,000 roubles were invested in school fund securities. 7,000 roubles were used to finance all needs of uezd educational institutions.

The pedagogic school staff was approved by resolutions of the uezd teaching board. Applicants were proposed by the uezd authority for intelligentsia employment. In case of several applicants, there could also be a contest when people demonstrated their skills within test lessons and written tasks.

Teachers worked for the whole academic year on the 6-hour-daily basis. They arranged study schedules as well. Curricula were compiled by the pedagogic staff for three years with lessons on non-agrarian days. The instructions focused on no using physical or other punishment for students. Curricula required approvals by members of the uezd teaching board. Each curriculum comprised the following subjects as a great educational force: Law of God, Russian language and literature, Slavic literature, basic mathematics, choir service, music.

The draft ensured a 200-rouble monthly salary for teachers. It was paid by zemstvo authorities. Besides, teachers were provided with a municipal service accommodation. There were supplements and rewards: 30 roubles monthly for over 60 children at school. In case of over 100 students, a teacher assistant was assigned with a 120-rouble annual salary. For each 5 years in office, there was a 50-rouble seniority pay. It could be also replaced by agricultural products. Via the Borzna budget, the zemstvo authorities could encourage teachers with extra 25-100 roubles.

The uezd library was free of charge for teachers and students. It gave knowledge, provided students with books and exhibited the latest scientific achievements in school subjects. Each summer, there was a pedagogical congress called by the uezd teaching board as a methodological conference. Teachers were granted a travelling and per diem allowance.

After consideration, the Borzna Uezd Assembly unanimously adopted the Instructions Act with a zemstvo authority duty to implement it (ZBZ, 1871, №3: 64-84).

Local zemstvo liberals conducted the same progressive policy in municipal self-government institutions. They were elected by the population majority as duma and council officials.

On 5 April 1872, the Chernihiv City Duma considered the school performance issue. V. Khyzhniakov, the city head and a liberal opposition member, spoke on the unsatisfactory school work: Chernihiv residents did not acquire an adequate elementary education. He noted an increasing education demand, which set an idea to create Sunday classes for illiterate adults. Within city schools, these classes were taught by experts for salary from local authorities.

Moreover, V. Khyzhniakov offered certain annual remunerations from the city budget: 100 roubles (teachers), 50 roubles (Law of God educators). Extra annual cash was granted to cover study needs: 50 roubles (learning materials) and 100 roubles (lease of premises). According to V. Khyzhniakov, the general budget of Sunday classes was up to 500 roubles annually. To supervise and inspect classes, an authorized person was elected. Annually, he reported on Sunday class activities during the duma session.

Finally, the Chernihiv municipal duma made the following decisions:

1. To create Sunday classes at municipal schools for adults (on the trial basis);

2. To develop Sunday class curriculum (V. Khyzhniakov as the author);

3. To charge city authorities with an application to the Chernihiv Uezd Teaching Board for the Sunday class unfolding;

4. To entrust the municipal duma to equip Sunday classes with necessary facilities.

Having not approved any financing issues of Sunday classes, V. Khyzhniakov as a city head allocated cash from his salary paid by the local authorities (SPCD, 1883: 79-80). Therefore, zemstvo liberals funded public education on the charity basis if there was no alternative way.

The Sosnytsia Zemstvo contributed significantly to the public education development. Here, the main liberal was O. Karpynskyi. On 26 September 1871, the Sosnytsia Uezd Assembly approved his proposal to reform the elementary education system like that in the Borzna region. Among his plans, there were the following ideas:

1. To comprehend the public education conditions in the Sosnytsia Uezd;

2. To offer peasant communities to unfold elementary schools and service infrastructure via zemstvo budget money as a seed capital;

3. To create four public schools in volosts in affordable circumstances;

4. To inform the Chenihiv Governorate authorities about the Sosnytsia Uezd interest in training elementary teachers. Therefore, the zemstvo budget had to grant three annual 80-rouble scholarships for future educators at the Chernihiv Teaching Seminary.

O. Karpynskyi initiatives displeased assembly conservatives who noted the weak uezd development and budget deficit. Alternatively, they offered a corporate noble education when aristocrats had more financial resources to support educational institutions.

From O. Karpynskyi's perspective, such a position is unacceptable. Elementary schools must be affordable for peasants as well. As the main zemstvo electorate and taxpayers, they should be supported in terms of getting education.

After consideration of O. Karpynskyi's ideas, the Sosnytsia Uezd Assembly resolved:

1. To recognize the public education development as a zemstvo economics priotity;

2. To charge zemstvo authorities and peasant communities with unfolding elementary schools in all possible volosts;

3. To grant more zemstvo scholarships for recruiting teachers at uezd public schools;

4. To approve the Sosnytsia education monthly salaries: 200 roubles (educators), 30 roubles (religion teacher). 70 monthly roubles were also given to buy learning materials;

5. To allocate 100 roubles for creating a trade class at the Mena Public School;

6. To prepare a zemstvo resolution to establish the annual pedagogic courses and the Sosnytsia Women's Progymnasium (Bushtedt, 1893: 93-99).

The zemstvo opposition made also a great contribution to public education when the Petrushyn Public School was created in the Chernihiv Governorate. O. Karpynskyi became the draft author and lobbyist because the village of Petrushyn was his "dynastic nest".

On 4 June 1874, the Kyiv Educational District warden received a note from O. Karpynskyi (as the Petrushyn peasant community representative). He applied for unfolding a 2-grade public school in the village. His initiative was explained as following a successful example of created 1-grade public schools in the Sosnytsia Uezd villages with a 550-rouble annual budget. He focused on progressive development of public education in this uezd whose general annual budget was 10,000 roubles (CGIAK. F. 707. Op. 225. D. 119: 7-8ob.). At the same time, the Petrushyn school budget was up to 915 roubles annually (CGIAK. F. 707. Op. 225. D. 119: 2).

On 5 October 1874, the headmaster of public schools in the Chernihiv Governorate informed that he did not object to the draft resolution on the Petrushyn Public School. Simultaneously, the Petrushyn peasant community was charged with insuring school facilities and covering administrative expenses. The community consented to such conditions.

The Chernihiv zemstvo authorities allocated 400 roubles to unfold the Petrushyn Public School. The peasant community collected 2,000 roubles for erecting the institution: 600 roubles – private donations; 300 roubles – Chernihiv zemstvo credit; 300 roubles – peasant taxes and duties; other money – charity (CGIAK. F. 707. Op. 225. D. 119: 23). Before construction, the institution was located in the house of aristocrat A. Shukhytskyi.

On 18 January 1875, the Public School Department within the Russian Empire Education Ministry sent a letter to the Kyiv Educational District warden. Signed by the education minister, the document reported on the State Treasury allocating 515 roubles to create the 2-grade Petrushyn Public School. The money was transferred to the bank account of the public school directorate within the Chernihiv Governorate (CGIAK. F. 707. Op. 225. D. 119: 15-16). On 2 May 1875, the headmaster of Chernihiv public school informed the Kyiv warden about the Petrushyn Public School work since 27 April (CGIAK. F. 707. Op. 225. D. 119: 18). Thus, it was the first leading 2-grade institution in the Chernihiv Governorate.

Till the 1870s end, O. Karpynskyi succeeded in education development. In 1876, his initiative made the Sosnytsia Uezd allocate 600 roubles for supporting the local women's progymnasium. In 1877, the zemstvo assembly approved the liberal idea of subsidizing uezd public schools with 250 monthly roubles (Bushtedt, 1893: 112-113; 117).

## 5. Conclusion

The 1870s were highly productive in education among the zemstvo liberal opposition of the Chernihiv Governorate. Their important achievement was creation of the Chernihiv Teaching Seminary in 1871. The Chernihiv zemstvo authorities (usually represented by liberals) drafted the Seminary Resolution. It ensured priorities of providing peasants with education when all 15 uezds of the Chernihiv Governorate were equally represented by students. Having studied on the zemstvo scholarship basis, graduates returned to teach at local elementary schools for at least three years.

According to this resolution, there were encouraging tools for teachers and students. That attracted new people to the seminary.

Drafted by M. Imshenetskyi and N. Volk-Karachevskyi and approved by the Borzna Uezd Assembly in 1871, the Instructions for Zemstvo School Headmasters were a confirmation of liberal approaches to the public education development in the Chernihiv Governorate. The document raised the following issues: individual upbringing ideals; a free compulsory elementary education for all social classes at zemstvo schools; an equal access to education (regardless of sex, race, nation, estate and confession). Elected zemstvo representatives could supervise and inspect such institutions. Curricula were arranged by zemstvo educators. There were regular pedagogic congresses and a detailed remuneration system for teachers. Till the Counter-Reform Period, zemstvo liberals implemented most above-mentioned principles to some extent.

Another relevant contribution was initiatives of V. Khyzhniakov, the Chernihiv mayor and a liberal oppositionist. He opened evening and Sunday classes to educate illiterate people. With a lack of municipal allocations, V. Khyzhniakov charged himself with economic and administrative provision of such institutions.

O. Karpynskyi, a Ukrainian zemstvo liberal, promoted public education as well. He realized his progressive ideas within the Sosnytsia and Chernihiv Uezds. In particular, the 2-grade Petrushyn Public School was unfolded as the first Chernihiv institution of such a type. To reach this aim, O. Karpynskyi collected donations and succeeded in financing via the state treasury money.

Finally, we can conclude that the vivid public education activities of zemstvo liberals within the Chernihiv Govenorate reflected attempts of deep local and state transformations. The goal was creation of literate and sensible citizens as a part of the capitalism order.

## 6. Acknowledgements

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# Activities of Scholar Schools at Imperial Universities to Organize Students' Individual Work

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**Abstract**

The article deals with analysis of sources, academic and research reports, curricula, lecture notes and methodological papers at imperial universities in Kiev, Kharkov and Odessa. It covers useful resources, disciplines, theoretical approaches and methodological requirements for organizing students' individual work within the higher education system. The results let us note a great contribution of imperial university staff to arrangement of theoretical and practical issues in organizing students' individual work.

The article presents the results of a study of the historical transformations of students' individual work in the imperial universities of Kiev, Kharkov and Odessa in the second half of the 19th and early 20th centuries. The author examines the content and procedural realizations of forms and methods of students' individual work. The models of organization of integral individual work of students of imperial universities are analyzed. The formation of scientific schools in the imperial universities of Kiev, Kharkov and Odessa and their influence on the individual work of students in the specified period are studied.

The problem of the influence of scientific schools on the organization of individual work of students of imperial universities is substantiated. It is emphasized that an important aspect of this influence is the figure of the head of the scientific school, who was usually a professor, head of the department.

The influence of scientific schools on the organization of individual work of students is considered through the activities of representatives of the scientific and intellectual elite of the imperial universities of Kiev, Kharkov and Odessa, in particular, P. Yurkevych, S. Hohotskyi, V. Ikonnikov, G. Chelpanov and others. Professors and leaders of scientific schools gave lectures and conducted practical classes aimed at developing creative thinking and self-criticism in students.

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Through their scientific and pedagogical activities, they also developed the skills of individual research among students.

**Keywords:** education, education reform, educational governance, educational policy, higher education, universities.

**1. Introduction**

Within the whole history, researchers have been focusing on the Ukrainian education development. It is the progress of Ukrainian native lands that attracts a deep interest as well, especially during the Russian Empire rule when "imperial universities" were established. Historians appeal to public figures who represent cultural values. To a certain extent, this process is an independent and objective component of the historical and educational discourse. The academic personality is more than a scientific, educational or artistic biography. It is rather a personified creation of values and culture in terms of humanities. In other words, that is a concretized model (Sukhomlynska, 2003: 42).

**2. Materials and methods.**

The methodology of research on scientific schools of imperial universities includes several key stages and methods that allow us to better understand and analyze the development, influence and interaction of different scientific schools on the scientific work of students. In preparing this manuscript, we used various methods and approaches, in particular, conceptualization and classification of scientific schools of imperial universities of Kiev, Kharkov, and Odessa. The use of these methods allowed us to identify the main scientific schools of the Imperial Kharkov, Novorossiya Universities, as well as St. Vladimir's University in Kiev. It also made possible to classify the scientific schools of these universities according to various criteria.

The use of the methodology of historical analysis made it possible to study the history of the emergence and development of scientific schools in the imperial universities; to analyze the key stages of their development and changes.

The analysis of the influence of scientific schools of imperial universities consisted in the study of the influence of specific scientific schools on the development of science in general and student science in particular. Based on this, their impact on related fields of knowledge was also analyzed.

Institutional analysis outlined the prospects for researching the role of scientific and educational institutions of the Russian Empire in the development of scientific schools of the imperial universities of Kiev, Kharkov and Odessa.

These and other research methods allow us to obtain a comprehensive view of scientific schools, their development, influence and interaction, which contributes to a deeper understanding of scientific progress and its determinants.

**3. Discussion**

The history of the higher education system of the Russian Empire contains various aspects of its consideration: scientific and pedagogical, administrative, legal, socio-historical and others. In this regard, the scientific and pedagogical aspect of the development and functioning of imperial universities in Ukraine can be considered in its two components: scientific and pedagogical. Which in turn are correlated with the activities of the teaching staff, on the other hand – with the scientific research of students and university students.

This issue can be considered in the context of the general development of the education system in the Russian Empire and in the Ukrainian lands, in particular. General trends in the development of university education were expressed in the works of O. Sukhomlinskaya (Sukhomlynska, 2003), N. Demyanenko (Demianenko, 2016), M. Polyakov (Poliakov, 2004), N. Mozgova (Mozghova, 2004) and others.

An important place is occupied by the works and memoirs of contemporaries, which allow us to reconstruct the everyday life of the university life of the XIX – early XX centuries. Among others, this group of works includes studies by V. Ikonnikov (Ikonnikov, 1876), A. Sobolevsky (Sobolevskii, 1925), N. Sumtsov (Sumtsov, 1905) and others (Vospominaniya..., 1917).

Of considerable interest are the works of representatives of scientific schools that directly determined the vector of development of domestic science: P. Yurkevich (Yurkevich, 1865; Yurkevich, 1860; Yurkevych, 2004), V. Ikonnikov (Ikonnikov, 1876), S. Gogotsky (Gogotskii, 1882) and others.

It is worth noting separately the sources and publications containing important statistical and other factual data, in particular, the rules for university students and trainees (Pravila..., 1905; Predvaritelnie pravila, 1803), documents of normative nature (Polozhenie..., 1819; Polozhenie..., 1837; Polozhenie..., 1844), reviews (Dvadtsatipyatiletie..., 1902; Fakultet, 1908a; Fakultet, 1908b; Istoriko-statisticheskie zapiski..., 1884; Obozrenie..., 1850–1858; Obozrenie..., 1852–1857), etc.

## 4. Results

For the subject field of our study, it is important to regard academic personalities of imperial universities on Ukrainian lands (the 19th century first half till the 20th century beginning) as scholar school leaders. They united talented young researchers, produced new progressive approaches to education and science.

The source analysis makes us treat the notion "scholar school" as a specific form of research organization when a group of scientist support and develop ideas of a recognized expert. The distinctive feature of scholar schools is a combination of acquiring and accumulating knowledge with a subsequent preparation of specialists. Therefore, the professional competence is transferred from generation to generation (Profesiina osvita, 2000: 212).

N. Demianenko defines the scholar school as an informal scientific community supervised by an authoritative researcher. To identify such a community, it is necessary to have at least one generation of disciples (Demianenko, 2016).

In our study, we regard an imperial university department as a scientific and methodological residence of managing students' research activities, which is led by the department head. Simultaneously, the same department could consist of several scholar schools who followed ideas of their leaders.

From the scholar school perspective, it is relevant to cite M. Pyrohov. He mentioned the vital need to merge research and education into a single and boundless unity in the university space. Science promoters try to involve other people into this sphere. On the contrary, science teachers try to upgrade this sphere (Vospominaniya..., 1917: 57).

The reviewed sources show progressive methods were used in lecturing with focus on students' individual work. Among them, we can enumerate the following approaches: problem search (V. Ikonnikov, M. Maksymenko, M. Hrushevskyi), truth search (D. Bahalii), application of European research heritage (S. Smal-Stotskyi), comparison (V. Buzeskul), dispute (O. Stoianov), law case study (L. Kaso), equipment use (E. Tanhl), etc.

Along with development of the Ukrainian university education, pedagogics as a separate discipline was founded as well. Thus, pedagogical scholar schools were unfolded while students' individual work was interpreted and introduced. As one of the oldest pedagogical issues, students' individual work was considered when the first scholar schools appeared at the Kharkov, Saint Vladimir and Novorossiya Imperial Universities (in Kharkov, Kiev and Odessa, respectively). For their academic staff, students' individual work was a research activity and a way of taking degrees.

Degrees were conferred by imperial university faculties if a person had defended a thesis publicly. The defending process took place before all faculty members. It comprised ordinary and extraordinary professors that were headed by the dean. Associate professors could vote only after two-year office. Usually, there were also two opponents. At the 20th century beginning, their fee was 200 roubles. Defending results were ratified by faculties (usually) or education ministers (since 1819). General principles of degree acquisition were arranged in university charters. More detailed guidelines were regulated by a special resolution of the Public Education Ministry (Predvaritelnie pravila..., 1803; Polozhenie..., 1819; Polozhenie..., 1837; Polozhenie..., 1844; Pravila..., 1905).

To participate in the competitive selection for an academic teaching position at Ukrainian imperial universities, people had to conduct individual research with further publications. That was a precondition to get a teaching permission. Another requirement was applicant's recognition as a researcher.

The imperial universities in Kiev, Kharkov and Odessa kept an academic tradition of staff attestation and degree conferment (Master, PhD, DSc). Since the 1850s turn, there was a control over writing and defending theses. Especially, that concerned the research content and its aim at the state order. Respective university rights were regulated by Chapter IX "Degrees and Honored Members" in the University Charter as of 1863.

In contrast to West European institutions with their faculty degrees, imperial universities of Ukrainian lands conferred one of 39 science rank (specialty) degrees. The latter was provided for by the Degree Resolution as of 4 January 1864 (Poliakov, 2004: 119).

Let us discuss the scholar school development at the Kiev Saint Vladimir Imperial University. According to sources, the first pedagogics lecturer was S. Hohotskyi (a DSc in Philosophy and Ancient Philology, ordinary professor of the Kiev Theological Academy). Previously, he passed all tests and publicly defended his thesis to get the degree.

Such an example reflects the university autonomy to confer degrees. Besides, the recognition procedure was also quick: S. Hohotskyi defended the thesis on 4 October and acquired the diploma on 5 January.

One of positive criteria for any scholar school leader is his own consideration of scientific problems, including students' individual work. Treating the cognition essence, S. Hohotskyi discerned the importance of empathy in the educational process. In other words, teachers should talk to and love their students, which promotes a balanced mechanism of individual work (Gogotskii, 1882: 1). From the S. Hohotskyi's perspective, the self-education inspiration should be found in developing individual initiatives of students. The stronger individual initiatives a person has, the more interest in education he reveals. Consequently, knowledge accumulation was only a transitional stage in achieving the higher education aim. The principal education task is development of ethical initiatives, moral independence and internal self-education skills. Thus, the need for individual initiatives is genetically inherent. Teacher must upgrade these initiatives to a higher level. Such a basis could promote students' individual work properly and effectively.

Meanwhile, initiatives were not equal to individual work. The former was rather a basis for the latter. S. Hohotskyi regarded initiatives as a way to reach aims in the individual work.

Except for the historical-philological faculty, the physical-mathematical and law units at the Kiev and Kharkov Imperial Universities taught pedagogics as an extra optional discipline for all students in the 1850s-1860s (Obozrenie..., 1850–1858; Obozrenie..., 1852–1857).

Within the curriculum disciplines, "Upbringing" alternated with "Theology" 3 times per week, "Psychology" alternated with "Didactics and Applied Pedagogics" 2 times per week. In 1854–1855 at the Saint Vladimir University, S. Hohotskyi taught "Didactics and Applied Pedagogics" 4 hours per week, "Upbrinding" 2 hours per week. Students attended his theological lectures as well.

Like Kharkov, Kiev taught optionally pedagogics 2 hours per week for students of the physical-mathematical and law faculties. In 1850–1860, these students participated in scientific disputes with S. Hohotskyi, did exercises, gave individual classes, acquired professional skills.

The fact of individual pedagogics choice over compulsory disciplines confirms a great popularity of S. Hohotskyi's lectures. He could arouse students' interest and increase their educational initiative. So, apart from compulsory courses like "History of Russian Linguistics" and "Theology", students eagerly studied "Pedagogics".

Professor S. Hohotskyi paid a significant attention to consideration of higher education pedagogical theory and search for methods and forms to improve students' individual work, study progress, special training.

In 1859–1860, S. Hohotskyi taught "Didactics and Applied Pedagogics" (3 hours per week in the 8th semester) as well as "Upbringing" (3 hours per week in the 7th-8th semesters) for all historians and philologists as well as physicists and lawyers of budget-funded education.

After the 1863 University Reform, the Saint Vladimir Imperial University proposed the philosophy course again. It was taught by secular staff. A great popularity was attracted by S. Hohotskyi who successfully lectured on philosophy history with the Divine Revelation principle (Mozghova, 2004: 176). S. Hohotskyi was a skilled lecturer and orator. He lectured in 1850–1870 when enlightenment and materialism dominated among students (Mozghova, 2004).

S. Hohotskyi was awarded by the academic community of the Saint Vladimir Imperial University for his teaching the course "History of Modern Philosophy". By request of the historical-philological faculty, the University Board applied for S. Hohotskyi's awarding to the Public Education Ministry on 8 August 1850. In particular, 30 silver roubles were awarded to S. Hohotskyi for his previous year's lectures on modern philosophy history 3 hours per week. This application was approved.

The above-mentioned statements confirm the diversity of S. Hohotskyi as a researcher and teacher who laid the pedagogical foundation at the Saint Vladimir Imperial University. Being the scholar school leader, S. Hohotskyi demonstrated own ideas of students' individual work. The obtained academic heritage was decisive for his followers.

S. Hohotskyi's pedagogical traditions were advanced at the 1890s beginning by O. Hiliarov (a professor of philosophy history and psychology). There were significant changes in the philosophy department staff. In 1905, the pedagogic courses began at the historical-philological faculty. Taught by O. Hiliarov 3 hours per week, these courses ("Philosophy History", "Logic", "Psychology") revealed some pedagogical issues.

The historical-philological faculty could approve curricula and organize tests via special boards. For a passed exam, certificates were granted to students. Besides, O. Hiliarov taught Higher Women's Courses in Kiev. Practical classes in pedagogics were conducted in groups and alternated with other disciplines (on Saturdays, there were classes on Russian history and pedagogics). All creative activity of O. Hiliarov as an academic philosopher was associated with the Kiev Saint Vladimir Imperial University.

Therefore, the first half of the 19th century laid a foundation of the pedagogical scholar school at the Kiev Saint Vladimir Imperial University. Here, a great pedagogical role was played by V. Ikonnikov. He wrote famous publications: "Historical and Statistical Notes on Researchers and Facilities of the Saint Vladimir Imperial University (1834–1884)", "Biblical Dictionary of Members of the Saint Vladimir Imperial University (1834–1884)", etc. The historical and pedagogical analysis shows a perfect mastery of professor V. Ikonnikov in preparing students' courses. His personal approaches to problems of students' individual work can be traced in pedagogical lectures and historical classes.

Scientist O. Sobolevskyi regarded V. Ikonnikov's lecturing style as original, thorough and research-based. Students shared his ideas and understood the lecture essence. V. Ikonnikov could encourage everybody in study. Lecture materials were properly arranged to have all necessary things (more than textbooks provided) (Ikonnikov, 1876: 119). Therefore, V. Ikonnikov lectures were a product of previous experience. A wide stock of sources gave guidelines for search activities. In such a way, students acquired creative skills for future individual work.

V. Ikonnikov insisted on each student's scientific search to test their cognition and experience delight in individual discoveries. The professor treated old study methods and ignorance as the most dangerous things, which should be overcome by teachers. So, the V. Ikonnikov's perspective of students' individual work was based on need for knowledge, memory development, creative skills and scientific search.

It was a promising approach to organize students' individual work via the teacher-to-student and student-to-teacher principles by V. Ikonnikov. He used these rules in teaching at the Kiev Saint Vladimir Imperial University (1868–1918) and the Kiev Higher Women's Courses (1878–1889). The source analysis (Ikonnikov, 1876; Istoriko-statisticheskie zapiski..., 1884; Sobolevskii, 1925; Dvadtsatipyatiletie..., 1902) indicates his original style in organizing students' individual work. Here, both explanations and problem identifications were realized in teaching courses. It was not sufficient to include only the former even if demonstrations were engaged.

He offered to solve problems gradually via disputing and considering research methods as well as reassessing previous experience. Moreover, V. Ikonnikov succeeded in the Kiev Higher Women's Courses. In particular, he was appreciated by attendees because of perfect preparation for individual work.

V. Ikonnikov treated practical classes as a supplement to lectures within university education. Among individual assignments with manuscripts, the professor distinguished two types of students' exercises:

a) technical tasks: reading and rewriting texts;

b) practical tasks: processing, explaining, checking, arranging facts.

During classes, students compared sources, identified and criticized historical facts. Usually, classes comprised 5-15 students and alternated with other disciplines. Participants presented their individual research reports, which was later awarded and analyzed.

Sometimes, V. Ikonnikov proposed a student's lecture improvisation on certain topics. Practical classes lasted for 2 hours: the first for reading; the second for disputing. In such a way, the professor trained skills of future archiving specialists.

To succeed in conducting practical classes, V. Ikonnikov defined certain conditions. For example, it was relevant to allow for attendees' preparation, level of individual research skills, mix of various theoretical disciplines (law, medicine, philosophy).

V. Ikonnikov's classes were subdivided into:

a) reading and analyzing texts;

b) processing sources individually (manuscripts, philosophical treatises, letters, etc.).

A personal V. Ikonnikov's contribution to students' research development was his work for the journal "Universitetskie Izvestiia (University Proceedings)" of the Kiev Saint Vladimir Imperial University. In 1861-1883, the professor constantly assisted in preparing and publishing research reports of students and teachers.

Another scholar school developer at the Kiev Saint Vladimir Imperial University was professor H. Chelpanov who invented a new philosophical-psychological approach.

As a famous philosopher, logician and psychologist, he worked at the Kiev Saint Vladimir Imperial University in 1892–1900. At the 19th century end, pedagogics was not a separate discipline at imperial universities of Kiev, Kharkov and Odessa. Privat-docent H. Chelpanov started teaching the 2-hour-per-week courses "Psychology" and "Logic" (in 1892–1893) as well as "Introduction to Philosophy" and "Introduction to Psychology" (in 1897–1898). Also, new 1-hour-per-week courses appeared in 1898–1899: "Critical Review of Modern Spiritual Doctrines" and "Cognition Theory". In 1904–1905, professor H. Chelpanov taught the courses "Psychology" (3 hours per week), "Will Doctrine" (1 hour per week), "Logic" (3 hours per week), "Research Methods" (1 hour per week) at the Kiev Saint Vladimir Imperial University. Besides, he conducted practical classes on psychology 2 hours per week at the seminary (05:00-07:00 pm on Sundays).

H. Chelpanov provided a psychological and pedagogical preparation for future specialists via lectures on cognition and practical classes on psychology. For the latter, H. Chelpanov founded a psychological seminary as an auxiliary university facility of study and research. Presented during seminary classes in 1904, students' reports usually focused on philosophical topics. Examples were the following reports: "Berkeley Reality" (student Blonskyi), "Three Reports on Avenarius Cognition" (student Chyrkov), "Hartmann Reality" (student Oholovets), "Kant Doctrine on Thing in Itself" (student Shcherbyna).

H. Chelpanov contributed to experimental psychology. At the Kiev Saint Vladimir Imperial University, he unfolded an experimental psychology laboratory. In 1895, the Public Education Ministry considered his draft project of the Experimental Psychology Office as an auxiliary facility of the historical-philological faculty. The office had two aims: research and study. For the first goal, students upgraded theoretical skills of psychological analysis, observation and test. For the second goal, students practically selected and researched psychological samples.

Therefore, H. Chelpanov further developed the basics of experimental psychology that was founded by M. Lange in 1888 at the Odessa Novorossiya Imperial University. Previously, the Center of Psychological and Academic Thought was established here.

During lectures in the laboratory, H. Chelpanov demonstrated psychological tests and gave seminary classes. The laboratory was a basis to conduct research for every university member. H. Chelpanov was the first to introduce practical classes into teaching psychology. Moreover, the professor actively organized the I All-Russian Congress on Experimental Psychology in 1912 (Vserossiiskii sezd..., 1912: 26).

Thus, we can state that H. Chelpanov founded a psychological scholar school at the Kiev University. He combined students' individual research and study when gaining higher education. Noteworthy, names of O. Hiliarov and H. Chelpanov were associated with the prosperity of psychological and pedagogical approaches to professional preparation at the Kiev Saint Vladimir Imperial University.

The Kharkov Imperial University possessed scholar schools as well. In 1850, curriculum of the historical-philological faculty introduced psychology, logic and pedagogics as new courses (Fakultet..., 1908a: 8). The pedagogical course was regulated by Charter Article 124. Established in 1811, a separate pedagogical institute at the university had to teach students properly (Fakultet..., 1908a: 6). Also, the Resolution as of 5 November 1850 unfolded the department of pedagogics within the historical-philological faculty. Besides, pedagogics was recognized as a compulsory course for all faculties (except for the medical one). This course was primary for linguists and secondary for other students. A temporary pedagogical teacher was professor A. Valytskyi. Since June 1850, philosophy was not taught by secular staff. Together with logic and psychology, philosophy was further taught by theological professors.

The Kharkov scholar school was represented by M. Lavrovskyi. In 1852, the Public Education Ministry assigned him as an adjunct to teach pedagogics. M. Lavrovskyi was an adjunct of pedagogics and Master in Russian Philology (1853–1854), an extraordinary professor at the Department of Pedagogics and DSc in Russian Philology (1855–1856) (Fakultet, 1908b: 89)

The problem of teaching methods was critical for the pedagogical theory and practice among Kharkov professors. In particular, M. Lavrovskyi regarded use of various pedagogical techniques and students' individual work as one of conditions to adjust the study process and knowledge transfer properly.

The report "Spirit and Peculiarities of Teaching at the Imperial University" by rector O.P. Roslavskyi-Petrovskyi notes that M. Lavrovskyi lectured on history of upbringing and pedagogical theory, assigned exercises for attendees (Fakultet..., 1908b: 90). The professor acquainted students with modern scientific ideas. He gave practical classes and provided students with books from his personal library (Fakultet..., 1908b: 92). To activate students' individual work, M. Lavrovskyi asked attendees to answer questions in a written form via the source analysis. Also, oral responses with personal analysis were employed (Sumtsov, 1905: 17).

Apart from lectures, M. Lavrovskyi also conducted pedagogical workshops. Here, the third academic year students reported on research topics, acquainted themselves with the best techniques of teaching different disciplines. For this aim, the fourth academic year students did various written exercises to discuss important issues (Fakultet..., 1908a: 86).

Students delivered trial lectures before companions and professors. They concerned the discipline that would be taught after graduation. Professors corrected mistakes, made critical remarks, demanded explanations if students lectured in an obscure, irresolute or superficial manner.

M. Lavrovskyi supported verbal, visual and practical methods of teaching. It was practical methods that he applied most often. The practical techniques by M. Lavrovskyi concerned written exercises to assimilate essence of each discipline and to impart inclinations to individual work. This professor was regarded as a unique researcher and a perfect lecturer (Fakultet..., 1908b: 94).

At the Kharkov Imperial University, M. Lavrovskyi was followed by A. Valytskyi, A. Lebedev, M. Maslov, etc. The academic staff focused on progressive approaches to upgrade study via students' individual work. On 8 December 1901, the historical-philological faculty of the Kharkov Imperial University approved 16 departments. Here, the Department of Pedagogics was independent. The reasonable faculty proposal was supported. However, it was only the Resolution of the Public Education Ministry as of 24 April 1904 that recognized pedagogics as a compulsory course (Fakultet..., 1908a: 31).

Another situation was at the Novorossiya Imperial University. To enhance students' study of the historical-philological faculty, professor P. Yurkevych gave Latin classes with tasks of translation from Russian. Instead of oral exams, written ones were held because they match the course essence better and provide greater benefits.

To develop individual thinking skills, P. Yurkevych treated the institution as a place for youth training rather than studying. In such a way, students individually employ all education resources, which reveals the whole human potential (Yurkevych, 2004). According to P. Yurkevych, individual thinking consists in abilities to realize the idea-to-idea movement (Yurkevich, 1860). The pedagogical goal for the study process is practical use of knowledge and skills as well as mastery development.

Study progress depends on quantity and quality of student's rather than lecturer's work (Yurkevich, 1865: 152). Besides, P. Yurkevych urges students to acquire knowledge independently rather than to get data from their lecturer (Yurkevich, 1865: 169). Students' individual work may be predicted via methods of study arrangement, motivation and control.

Finally, it is also necessary to mention P. Yurkevych's perspective on exercises and individual tasks. They provide strong feedback to the learned material. In other words, education achievements are based on students' individual work (Yurkevych, 2004).

## 5. Conclusion

The analyzed sources of the given period show that students' individual work reach its climax prosperity at scholar schools of the imperial universities in Kiev, Kharkov and Odessa. Academic members P. Hulak-Artemovksyi, H. Kvitka-Osnovianenko, M. Kostomarov, M. Lavrovskyi, M. Maksymovych, O. Potebnia, F. Prokopovych, I. Sreznevskyi, M. Sumtsov, P. Yurkevych, etc. gave their lectures and practical classes to enhance creative thinking, cognition, independence and self-criticism among young people.

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# Public Statements on Mathematics Teaching Practices in the Kharkov Educational District in the Russian Empire in 1863

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## Abstract

An intense discussion on issues of teaching specific subjects took place in the Kharkov Educational District in the early 1860s. While the teaching of Russian language arts and geography prompted vigorous debate, in case of mathematics it is more appropriate to speak about public statements. They were associated with the 2nd teacher congress, organized in Kursk (May 12–18, 1863), which, on the initiative of the provincial educational authorities, discussed issues of teaching arithmetic and geometry. Fourteen reports were written by individual teachers for the congress, but the event failed to generate a general discussion on teaching as all participants followed similar methods and tried to make instruction in mathematics visual and practice-oriented; they all agreed that there were no good arithmetic and geometry textbooks (albeit, the main drawback of some textbooks was their high price). As a result, only general pedagogical issues, such as whether district schools should be specialized or general educational institutions, whether classes should be arranged as a dialog or monolog and aspects related to topic-specific teaching, caused some dispute. Therefore, we can argue that in case of mathematics generally accepted teaching practices took shape in the Kharkov Educational District in the early 1860s, in contrast to language arts and geography. In addition, with public statements on teaching mathematics, we can better understand the everyday life lived in provincial district schools in the Russian Empire in the 1860s: the materials show that children were instructed using methods of measuring classes and various objects, and even setting up topographic surveys by pupils.

**Keywords:** history of pedagogy, teaching methods, historical pedagogical concepts, Kharkov Educational District, E.I. Beyer.

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## 1. Introduction

Our research papers "A Discussion of the Practices for Teaching Language Arts Employed in the Kharkov Educational District in 1863: The Case of Novocherkassk Host Gymnasium and "Discussion of Geography Instruction in 1863 in the Kharkov Educational District, the Russian Empire" explored respectively the debate, which took place in the Russian Empire, in the Kharkov Educational District in the early 1860s, on how Russian language arts and geography should be taught (Peretyatko, Svechnikov, 2022a: 981-993; Peretyatko, Svechnikov, 2022b: 1327-1338). The discussions, on the one hand, gave us an insight into the everyday life of provincial educational institutions in the Russian Empire in the middle of the 19th century, and on the other hand, helped us reconstruct the pedagogical concepts of ordinary provincial teachers, the category of people who seldom come into focus of pedagogical historians. This paper continues the series and is devoted to public statements on mathematics teaching methods in the Kharkov Educational District in 1863.

## 2. Materials and methods

Our research will review public statements on mathematics teaching methods, made in the Kharkov Educational District in 1863, in particular to the report "On teaching arithmetic and geometry in district schools" (Tsirkulyar, 1864: 47-60) by Postoev[1], a teacher at the Rylsk District School, "Proceedings of the sessions by the Pedagogical Congress of District School Teachers of Arithmetic and Geometry, which took place in Kursk in May 1863" (Tsirkulyar, 1864: 36-47) and the "Opinion of Acting Ordinary Professor Beyer of Kharkov University on the aforesaid congress" (Tsirkulyar, 1864: 60-63). Using the historical descriptive method, we will re-create the logic and chronology of the statements made by all participants in the described events on how instruction in mathematics should be provided, while with the historical comparative method, we will compare the situations around teaching mathematics, Russian language arts and geography in the Kharkov Educational District in the early 1860s.

## 3. Discussion

The discussions on teaching methods for Russian language arts and geography in the Kharkov Educational District in 1863 were shop floor initiatives. The discussion on Russian language arts was started by a teacher of the Novocherkassk Military Gymnasium, A.M. Savel'ev, who compiled the report "On teaching Russian language arts in gymnasiums" (Tsirkulyar, 1863a: 65-70). The discussion on geography is also linked to a report by an ordinary teacher, Spasskii, who taught at the 1st Kharkov Gymnasium and came up with a "Report on teaching geography in gymnasiums" (Tsirkulyar, 1863c: 113-123). Public debate on teaching mathematics had somewhat different origin – it was purposefully organized by the provincial educational authorities of the Kursk governorate.

The background of the initiative dates back to 1861, when a Kharkov University professor, N.A. Lavrovskii, looked at the experience of German teachers' meetings (Lehrer Conferenzen) (Tsirkulyar, 1861: 6). Although he recognized that implementing the German experience of pedagogical meetings by teachers of various institutions was impossible in the Russian Empire because of large distances between locations, the professor nevertheless proposed to try an experiment by bringing together teachers from at least several (from three to five) district schools to teacher congresses during holidays (Tsirkulyar, 1861: 7). However, in the same year, the director of the Kursk Gymnasium, D.G. Zhavoronkov, voiced his considerations regarding such congresses (Lavrovskii, 1863: 53). He offered his own concept of holding teacher congresses, in which each congress was to be dedicated to a specific topic and arranged in the provincial center during an academic year (Lavrovskii, 1863: 53). It was characteristic of the intellectual climate in the Kharkov Educational District in the early 1860s that it was permitted in the Kursk governorate to set up teacher congresses using the model. Despite this, N.A. Lavrovskii criticized their organization system not in the local press, but in the metropolitan Journal of the Ministry of Public Education.

The criticism was directed at the 1st teacher congress in Kursk, which was held January 8 through 14, 1862 (Lavrovskii, 1863: 53). N.A. Lavrovskii emphasized that the congress had been dedicated to teaching the Russian language, and along with teachers from Kursk governorate district schools, it was attended by the director of the schools (moreover, he was elected chairman),

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[1] No initials are specified for the provincial teachers whose names and patronymics we have not precisely identified.

gymnasium teachers and outsiders (Lavrovskii, 1863: 53-54). Overall, N.A. Lavrovskii, with some reservations, considered it very useful to focus the congress on a specific subject and invite gymnasium teachers to the event, but he was adamantly opposed to the presence of the school director and outsiders (Lavrovskii, 1863: 53-54). From his viewpoint, teachers felt extremely fettered both by being exposed to public and, especially, by the fact that the congress was chaired by their immediate supervisor. N.A. Lavrovskii provided a very eloquent description of the teachers' fear of the director (we think the characterization, unfortunately, works out well for education systems in many countries even today): "Such chairmanship, in our firm belief, will entail restriction of freedom and ease of judgment, restriction of the independence and initiative of members, conspicuous silence, the dominance of the director's opinions and blind, involuntary submission to the opinions" (Lavrovskii, 1863: 54-55). Congress materials, N.A. Lavrovskii pointed out, fully confirmed his concern – they included "a rather voluminous report from the chairman", "a lengthy opinion of a gymnasium teacher" and "brief proceedings containing only a small extract from the latter opinion" (Lavrovskii, 1863: 55).

However, N.A. Lavrovskii stressed that the gymnasium teacher's opinion, which served as the basis for the congress, "is thoroughly thought out, carefully placed (against teachers' capabilities – Auth.) and reveals both in-depth knowledge of the best existing manuals to teach the Russian language at a primary level, as well as love for their work and pedagogical discretion" (Lavrovskii, 1863: 57). He also admitted that "the opinions handed down" could be even more useful for teachers than "the troublesome and, although not achieving the goal, but independent discussion of the same issues at other congresses" (Lavrovskii, 1863: 56). In general, N.A. Lavrovskii's criticism could be reduced to the essence that the discussion had been substituted with training, and even the personal opinions on the issues under discussion, prepared by almost every teacher, except one, were not attached to the congress materials (Lavrovskii, 1863: 56).

As a result, the 2nd teacher congress in Kursk (May 12–18, 1863), dedicated to the aspects of teaching mathematics, was organized as a discussion, and the authorities of the Kharkov Educational District published in their circulars both detailed materials of the event and their review by a representative of the Kharkov University (Tsirkulyar, 1864: 36-63). The administration also published the best report by one of the district school teachers, Postoev, "On teaching arithmetic and geometry in district schools" (Tsirkulyar, 1864: 47-60). We will begin with an analysis of this interesting document, although emotional and subjective at times.

The report "On teaching arithmetic and geometry in district schools" is largely comprised of generalities and ideas, obvious in terms of modern pedagogy, such as "They require that a child that left a general education institution should possess the mental and moral principles that are necessary for a person to become a valuable participant of social life over time" (Tsirkulyar, 1864: 47). However, the attention to the generalities was brought about by the specific context of Postoev's teaching reality – apparently, he encountered some difficulties precisely when he tried to put into practice pedagogical concepts that were already evident in his time. For example, the teacher put it before the pedagogical council of the Kursk Gymnasium as early as in 1857 that "The practice and theory of teaching arithmetic and geometry should go hand in hand and mutually help each other" (Tsirkulyar, 1864: 50). Postoev's colleagues did not object to the pedagogical idea (at least, he did not mention it), but his attempt to implement it in practice ended with the reproach that "I supposedly deviated from the purpose of general education institutions and imbued geometry with a specialized nature – as if I teach agriculture rather than geometry" (Tsirkulyar, 1864: 50). Referring to this case, Postoev concluded: "General unsubstantiated claims lead to misunderstandings" (Tsirkulyar, 1864: 50). For this reason, his own text mainly contains evidence to confirm the pedagogical generalities and describes how they should be implemented in practice.

As a result, Postoev's report cited many trite ideas already at the start, such as "district schools are general education institutions," and the goal of teaching arithmetic and geometry in them is "true education" (Tsirkulyar, 1864: 47). However, as he brought the trite ideas into practice, he came to conclusions that are hardly trite: in his opinion, arithmetic should train not only mental, but also "physical abilities to the greatest possible extent" and do it as part of general and not specialized education; in his pupils, a teacher should also shape skills of "self-initiated activity that primarily determines strength of will, love of learning and love of work in general"; and, finally, it was important to teach children not only "theory", but also give them "hands-on information required in life" (Tsirkulyar, 1864: 48). All this allowed Postoev to formulate the thought essential for his further arguments that, with the right system of teaching mathematics in

district schools, "pupils, guided by a teacher, pave the way to knowledge themselves using their own intellect" (Tsirkulyar, 1864: 48). Hence, proceeding from the trite ideas, Postoev was able to reach the original inference that a teacher's task was not to give children knowledge, but to teach them to seek knowledge.

We will further omit the trite ideas cited by Postoev to focus precisely on the conclusions he derived from them. At the same time, it should not go unnoticed that, if compared with A.M. Savel'ev's report "On teaching the Russian language arts in gymnasiums" and Spasskii's "Report on teaching geography in gymnasiums", Postoev's report "On teaching arithmetic and geometry in district schools" is much more abstract, features much more statements on how to teach in general, and much fewer references to the actual situation in provincial educational institutions in the Russian Empire in the early 1860s We would connect this with the origin of the texts: while A.M. Savel'ev and Spasskii composed their reports of their own accord, willing to address the problems that prevented them from teaching effectively, Postoev's move was dictated by the request of his superiors. Accordingly, A.M. Savel'ev's and Spasskii's texts are devoted to specific problems of the educational system, and Postoev's report concentrates on the theoretical dimension of the best teaching methods.

The first specific issue Postoev reviews serves as an excellent illustration of the difference. The issue deals with the textbook to be used at classes. It should be noted that A.M. Savel'ev and Spasskii also turned to the problem. Apparently, the lack of good textbooks was a sore point for teachers in general in the Russian Empire at that time. For example, Spasskii drew attention to the fact that there was no Russian geography textbook that would serve as a "guide" and a "manual" at the same time (i.e. combine theory and popularized presentation) (Tsirkulyar, 1863c: 114). A.M. Savel'ev resorted to a more laconic and harsher wording: "Everyone is convinced that we do not have any decent textbook on Russian language arts" (Tsirkulyar, 1863a: 65). Further, the teachers, after having pinpointed the problem, proposed ways to deal with it. For example, Spasskii recommended using additional literature at geography classes (Tsirkulyar, 1863c: 114). A.M. Savel'ev, on the contrary, wanted to accelerate the writing of a high-quality textbook and put forward his own ideas to this end, and also shared his own preliminary materials that he used instead of a textbook (in fact, popular essays on the history of Russian literature) (Tsirkulyar, 1863a: 66-78).

Postoev took a markedly different path. Instead of analyzing the situation with arithmetic and geometry textbooks for district schools, he formulated the question in the following form: "When teaching arithmetic and geometry in district schools, is it necessary to provide pupils with textbooks on the subjects?" (Tsirkulyar, 1864: 48). He further drew a conclusion that a textbook was necessary, because "a book, while compelling a pupil to resolve some of his perplexities, teaches him to rely more on his own efforts, teaches him to discover reasons behind everything using his mind and, therefore, better accustoms him to independence and work, and better strengthens his willpower" (Tsirkulyar, 1864: 48). Postoev's only really interesting proposal here was not to give a textbook to first-grade pupils who could hardly read and were unable to understand it, and the bad experience with using a textbook resulted in the pupils "neglecting it in the upper grades as well" (Tsirkulyar, 1864: 49).

Having outlining this at the beginning of his report, Postoev turned to existing textbooks for district schools only at the very end – and attacked them without mercy and with much greater detail and emotion than A.M. Savel'ev and Spasskii. He lashed out at certain textbooks (without specifying their authors), rather than their entire set – his criticism demonstrated no system or consistency. For example, he most heavily criticized the first-grade textbook, the use of which Postoev considered a pedagogical mistake, regardless of the quality of the textbook itself (the teacher was, in particular, displeased with outrageously vague and ambiguous wording, such as the following: "Everything that one can envisage to increase and decrease is called magnitude") (Tsirkulyar, 1864: 57-58). He gave the textbook for the second grade some credit ("much better than many other textbooks in the area"), but Postoev scolded it for many particular shortcomings, both seeming and false ones: for example, he did not like that operation rules for whole and fractional numbers were explained apart from each other (Tsirkulyar, 1864: 58-59). His criticism of the geometry textbook intended for the third grade appears more justified – Postoev pointed out here that it contained almost no guidelines on how to apply geometry in life, which made the textbook uninteresting for pupils (Tsirkulyar, 1864: 59-60). With the argument, the teacher came to a clear conclusion – the textbook was "absolutely of no benefit to pupils" (Tsirkulyar, 1864: 59).

What should be done if, on the one hand, third-grade pupils were supposed to use a geometry textbook, and the available textbook was totally useless? Postoev did not even raise the question. His criticism of the textbooks did not correspond to anything and led to nothing. As a result, his report merely stated that the available textbooks were bad, but it remained unclear how he himself addressed the problem in practice. To sum up, speaking of the textbooks, Postoev's report "On teaching arithmetic and geometry in district schools" outlined two separate, unrelated ideas: that instruction should be generally provided using a textbook, except for the first grade, in which children only started to learn how to read; and that specific arithmetic and geometry textbooks for district schools of the Russian Empire ranged from bad to completely useless.

After he touched on the need for textbooks, Postoev raised the question of what teaching method should be used – an "acroamatic" one (i.e. with a focus on lectures delivered by a teacher) or "Socratic" one (i.e. with a focus on the question-and-answer form) (Tsirkulyar, 1864: 49). It can be seen the question was again formulated in a very abstract way, suggesting a choice between two opposite methods that are rarely employed as they are. Indeed, Postoev concluded that, although the "Socratic" method was better (since it promoted the "self-initiated activity" of students, which, to his eye, was essential), its use also implies several concerns (Tsirkulyar, 1864: 49-50). In particular, he argued (it is not clear if he relied on his actual experience or theoretical ideas) that with the purely Socratic method, "pupils become accustomed to giving short, specific answers to a teacher's questions, and this lands them in difficulties in situations where it is necessary to explain several truths, which requires smooth and well-considered speech" (Tsirkulyar, 1864: 50). Eventually, Postoev came to the conclusion that "the Socratic and acroamatic methods should be combined" – he proposed conducting lessons in the question-and-answer form, but at the end repeating the lesson content clearly and consistently in the narrative form (Tsirkulyar, 1864: 50). This overall conclusion is very interesting as it shows that Postoev designed his lessons with a logical and consistent structure.

Next, he turned to the last theoretical issue in his report, the issue of whether lessons in district schools should give children both theoretical and practical knowledge. We have already described Postoev's general views on the matter; therefore, here we will constrain ourselves to pointing out that, as he promoted the importance of practical knowledge in the school program, he referred to real-world experience as well: because the theoretical study of the Pythagorean theorem will not catch a pupil's interest, but if you show him how to find the distance between opposite angles of the blackboard without measurements, if the length and width of the blackboard are known, the child will not only become interested, but can in a similar way calculate the distance between the corners of a sheet of paper or a classroom (Tsirkulyar, 1864: 51).

Only after this Postoev quite briefly described how he carried out his own classes. Interestingly, he himself positioned this part of his report as a description of "the order that I have followed until now when teaching arithmetic and geometry to pupils" (Tsirkulyar, 1864: 52). The author himself considered this portion of his paper to be of little importance and did not attach any major value to the sequence of delivering various topics (Tsirkulyar, 1864: 52). However, in fact, it is this part of his report "On teaching arithmetic and geometry in district schools" that is of the utmost interest – and not because it described the topic delivery order, but because it demonstrate how the topics were presented.

Postoev could not elaborate on the problems that hampered efficient teaching simply because the problems did not exist. The practice-driven, "hands-on information required in life," which received the greatest focus in the theoretical part of his report, gave him a clue as to a simple and elegant way to make his course interesting for children that were backward from the start. The very first classes with the children were a good illustration of Postoev's approach – his pupils began their training by measuring various objects and gold coins, counting, for example, how many kopecks there were in one ruble, or what length a map had in different measures, and putting down the numbers on the blackboard (Tsirkulyar, 1864: 52-53). Similarly, he taught geometry with an emphasis on practice, for example, by drawing up terrain plans and carrying out construction calculations (Tsirkulyar, 1864: 56). This, of course, did not mean that no problems affected Postoev's teaching work, but their scale was local, and the teacher realized quite well what caused them: for example, he encountered certain difficulties when he explained decimal fractions. He associated the problem with the fact that "Russian units of <measurement>" (i.e., the ones that are now obsolete, such as versts, poods, etc.) were not based on the decimal system (Tsirkulyar, 1864: 54).

To summarize, we should state that Postoev had devised his own teaching system by 1863, and his superiors recognized it as effective. Unfortunately, he provided little detail of the system in his report "On teaching arithmetic and geometry in district schools," probably because he considered it self-evident and an extension from more general and well-known pedagogical ideas. However, in general, the system can be reduced to two main provisions – teaching mathematics should concentrate on developing children's independent thinking and be practice-oriented. As for the problems that Postoev faced, they were not very significant, with most serious of them being the rejection of the practice-driven nature of the school mathematics course by some people in his environment and the lack of a good textbook. Postoev suggested no ways to address them, and they seemed to be of little worry for him. At least, he described them not on his own initiative, but on instruction from his superiors.

As for the teacher congress itself, its materials had as many as two publications in "Circulars for the Kharkov Educational District" (Tsirkulyary po khar'kovskomu uchebnomu okrugu). First, the "Extract from the session proceedings of the second pedagogical congress in Kursk, compiled by Ostrovskii, Senior Mathematics Teacher at the Kursk Gymnasium" was came out in 1863 (Tsirkulyar, 1863d: 175-180). And it was not until 1864 that the "Proceedings of the sessions by the Pedagogical Congress of District School Teachers of Arithmetic and Geometry, which took place in Kursk in May 1863" were published (Tsirkulyar, 1864: 36-47). It should be noted that the texts have certain distinctions: for example, the first one simply informs that congress participants had "agreed that district schools should be general education institutions" (Tsirkulyar, 1863d: 175), while the second one includes the discussion on the point (Tsirkulyar, 1864: 37-39). For this reason, we will only refer to the second, more detailed text.

The program of the teacher congress was aimed to answer three questions: "1) what role and purpose teaching arithmetic and geometry had as academic subjects in a school course; 2) what the best method and way to teach the subjects were; and 3) what advantages and disadvantages the textbooks, used as guidelines on the subjects, had" (Tsirkulyar, 1864: 36-37). So, it discussed no fundamental issues in teaching mathematics. Nevertheless, the congress was not limited to pedagogical debate: in the first half of the day, participants attended classes in Kursk educational institutions and made tours of classrooms (i.e. with their specialized equipment in the gymnasium and in the real school) (Tsirkulyar, 1864: 37). Apparently, the program was filled with activities and aroused interest among district school teachers: on May 17, 1863, the congress did not even have time to hold sessions, as the teachers were so carried away by experiments with an electric battery (Tsirkulyar, 1864: 46). The sessions were actually held in the evening and lasted nearly 5 hours (from 6 to 11 p.m.) (Tsirkulyar, 1864: 37). They were chaired, apparently, following the criticism by N.A. Lavrovskii, described above, by two mathematics teachers of the Kursk Gymnasium (Tsirkulyar, 1864: 37).

Certain originality lies in the efforts by mathematics teachers to give an answer to the first of the questions posed. The point is that the issue turned out to be connected with a broader problem of whether school education should, in principle, be practice-driven. According to the proceedings, some of the teachers (unfortunately, their names and information how many there were of them were not published) insisted on extreme practice orientation, arguing that without it, district schools "would not enjoy the trust of society," because children were sent there with the expectation that the child could enter a job ("in a shop, in a craft or in the service") immediately after graduation (Tsirkulyar, 1864: 38). The other faction opposed the approach, offering very diverse and sometimes curious arguments, ranging from the obvious objection that schools could not provide practical knowledge to merchants, artisans and officials at one time, to the point in which attempts to train boys in areas of no interest to them were compared to training girls in music, which required a lot of money, and then "pianos stand like furniture and decorate halls" (Tsirkulyar, 1864: 38). As a result, a position prevailed that was close to what Postoev set out in his report: that district schools should not provide any specialized training, but "imparting a variety of useful true-to-life information" was essential to give teaching "a character that awakes interest and love for the subject" (Tsirkulyar, 1864: 38). Based on this, the purpose of teaching arithmetic and geometry was defined as follows: "Developing the mind, reasoning, strict logical consistency in judgments, initiative and delivering the material benefit that is necessary for everyone, whoever they may be" (Tsirkulyar, 1864: 39).

As for the second question, based on Postoev's report (i.e. assuming the primacy of the "Socratic" method, which was arrived at after a brief and uninteresting discussion), teachers formulated nine rules that, with some abridgments, we consider it possible to quote here:

1) "An explanation should necessarily begin with a practical question";

2) "When giving explanations, a teacher takes the greatest possible care to avoid early corrections or hints";

3) "A teacher pays attention not only to the logic of conclusions, but also to the correctness and accuracy of expressions";

4) "When asking a question, one should give a pupil time to collect his thoughts, but not too much, so that the class do not become distracted and scattered";

5) "When teaching, one should not delve too deep into catechization" (i.e. not to ask questions to which a pupil cannot know answers – Auth.);

6) "A teacher strictly matches requirements for pupils' written homework with the development level of the pupils";

7) Home assignments of only five types were allowed – describing a problem solution; describing an operation studied at classes; making drawings; preparing problems by pupils; cutting geometric shapes from cardboard and calculating their volume;

8) Teachers were not only allowed, but ordered to deviate from available methodological guidelines that, supposedly, offered more "visibility" rather than "precision";

9) The main rule of the teaching methodology declared the following: "Everything to be explained should have a solid foundation in the material that preceded it, the easiest things should precede the most difficult ones, and everything useful should precede less useful" (Tsirkulyar, 1864: 40-41).

Although the rules were, of course, somewhat naive (we will return to the aspect later), on the whole they corresponded well to the key idea of the pedagogical congress, which can be formulated as follows: teaching arithmetic and geometry in district schools should be a practice-oriented process, but have no specialized focus. To achieve this, teachers were supposed to use relevant preliminary materials from Postoev's report: it was proposed to open the course with "an overview of coins, units of measure, weight, volume, surfaces, etc.", and complete, as part of the study of geometry, with making full-fledged terrain plans (Tsirkulyar, 1864: 41-43).

Conceptually, the least interesting solution was put forward by the Kursk teacher congress for the third question on the congress agenda. In general, teachers totally agreed with Postoev's report by coming to the conclusion that textbooks were needed in all grades except the first one, and no good mathematics textbook was available in district schools (Tsirkulyar, 1864: 43-44). However, the teacher congress provided a lot of new details. For example, it reviewed different textbooks for the same grades and divided them into three groups based on their drawbacks (but, unfortunately, without specifying which textbooks belonged to which group): the first group was criticized for "unclear presentation", the second one for a dull and abstract style, and the third one, which offered satisfactory content, for a high price (Tsirkulyar, 1864: 44). So, mathematics textbooks, which would satisfy district schools, existed in the early 1860s (we could see above that the situation with gymnasium textbooks in geography and Russian language arts was different at the time). The problem was that public schools had no money to buy them. With this in mind, the teacher congress proposed a simple and inexpensive solution to the problem – to buy new textbooks not for every pupil, but for the school library (obviously, in one copy) so that a teacher could use them (Tsirkulyar, 1864: 44). The practice of replacing a textbook with "sketches" written by teachers themselves (according to A.M. Savel'ev, the practice was widely adopted among gymnasium language arts teachers of the time (Tsirkulyar, 1863a: 65) was rejected by the teacher congress with a concern that illiterate children would find them difficult to understand; copying them for personal use would involve an unreasonably large amount of time, and teachers might make mistakes when compiling such "sketches" (Tsirkulyar, 1864: 44). Only short "sketches", supplementing and not replacing the textbook, were permitted (Tsirkulyar, 1864: 44).

Apparently, discussing all the issues took less time than congress organizers had planned, and the activity had ended by May 16, 1863 (Tsirkulyar, 1864: 43-46). Therefore, skipping the session on May 17 was not accidental. On May 18, teachers got down to an additional question that had no relation to mathematics: Postoev proposed organizing afternoon educational conversations with pupils, as modelled by the Rylsk district school, where he taught (Tsirkulyar, 1864: 46). The conversations were not a trifle – children could ask any questions during the activity, and

teachers jointly prepared answers and sometimes included experiments to clarify their explanations, and at times teachers themselves did not know right answers (on one occasion they even had to invite a medical doctor to explain to pupils what caused lethargic sleep) (Tsirkulyar, 1864: 46). Other teachers found the conversations brought some value, but were impossible to arrange without engaging the entire faculty (Tsirkulyar, 1864: 46). Congress participants also managed to review the proceedings of past sessions, and at the end, in the manner, typical of the Kharkov Educational District in the early 1860s, the teachers wrote a document, addressed to their administration, in which they thanked it, expressed regret for imperfections in their pedagogical research and at the same time urged that the teacher congress proceedings should be communicated to other schools (Tsirkulyar, 1864: 47).

Thus, the proceedings of the Kursk teacher congress (May 12–18, 1863) demonstrate the same trends in mathematics teaching practices in district schools of the Russian Empire as those described by Postoev's report "On teaching arithmetic and geometry in district schools." Although the teacher congress was set up to drive free debate, and the authorities and outsiders were removed from it this time, only two rather theoretical issues sparked some discussion – to what extent school education should integrate hands-on knowledge, and what principle, the "Socratic" or "acroamatic" one in-class instruction should predominantly follow. The issues of teaching proper did not provoke any argument: all teachers agreed that mathematics training should combine practice and theory in district schools, that teachers had the right to deviate from methodological guidelines, that there were no good textbooks, but in case of some of them the problem was not so much rooted in content, but rather in costliness, and it was quite achievable in the near future to buy such textbooks not for entire classes, but at least for teachers, etc. Accordingly, we can state that, at least in the Kursk governorate, a consistent principle of teaching mathematics had been developed in district schools by 1863 without the educational district authorities having to intervene. And again, we should note that the cases with teaching geography and Russian language arts in gymnasiums, which we explored in our previous papers, had a different context: they were characterized with lively debate on teaching methods between teachers, which generated appeals to the authority and experience of the district administration (Peretyatko, Svechnikov, 2022a: 981-993; Peretyatko, Svechnikov, 2022b: 1327-1338). As a result, the discussions on how to teach geography and Russian language arts were essentially ended in the "Circulars for the Kharkov Educational District" by Kharkov University professors – of literature N.A. Lavrovskii (Tsirkulyar, 1863b: 105-109) and geography A.P. Zernin (Tsirkulyar, 1863c: 123-127). In case of mathematics, the right to make a closing statement was given to the third university professor, Ye.I. Beyer, but he, however, took a slightly different role (Tsirkulyar, 1864: 60-63).

It is appropriate to mention here that Ye.I. Beyer was more of a practical teacher than a scholar. He had a diploma of the Main Pedagogical Institute in St. Petersburg and had almost no publications in the academic press, but in the 1850s taught most of the mathematical courses at the Kharkov University (Bobritskaya, 2014: 168-169). Later, he took part in preparing at least one textbook for schools, published in 1868, "The experience of a primer on arithmetic for public schools, approved by the Ordinary Professor of Kharkov University von Beyer, Doctor of Pure Mathematics" (Rovskii, 1868). So, engaging him to evaluate the results of the Kursk teacher congress was more than a logical move.

However, even the accomplished university professor did not break the unanimity on the key issues of teaching mathematics, which reigned between congress participants. On the contrary, he said that "if words always go hand in hand with deeds (i.e. the teachers, who attended the congress, were really guided by the principles they declared – Auth.), teaching arithmetic and geometry in district schools of the Kursk Directorate should then undoubtedly be successful" (Tsirkulyar, 1864: 63). When he considered the congress' answers to the three questions formulated, Ye.I. Beyer simply agreed with the answers to the first and third of them (i.e. about the purpose of teaching arithmetic and geometry in schools and about the quality of available textbooks), and it was only the second question (i.e. about teaching methods) on which he allowed himself to make several comments, all the more interesting as they were based on the reports that were written by other district school teachers besides Postoev, but have not survived to this day (Tsirkulyar, 1864: 60-61).

According to Ye.I. Beyer, there were 14 such reports in total (including Postoev's one), and they described a rather similar teaching process: "All teachers are concerned to avoid definitions and plain mechanicalism (i.e. mechanistic teaching – Auth.) at the beginning and strive, on the

contrary, for extremely illustrative, lively and diverse teaching" (Tsirkulyar, 1864: 61). Distinctions in teaching arithmetic and geometry by district school teachers were reduced by Ye.I. Beyer to their choice of teaching aids and the order they followed to introduce topics (Tsirkulyar, 1864: 61). From his perspective, the practical focus in teaching mathematics was not optimal, and some kind of balance should be sought: literally Ye.I. Beyer wrote that "practical teaching techniques sometimes make it easier for pupils to understand the subject being taught," but "it is always the theory that gives the correct and strict direction to the reflective mind" (Tsirkulyar, 1864: 61).

However, Ye.I. Beyer considered that forcing a unified teaching methodology on all teachers was a fallacious approach in principle, openly calling it "fruitless scholasticism" (Tsirkulyar, 1864: 61). He argued that a teacher had the right to choose a method that was more consistent with his personality, and, in addition, the "Socratic" method was very time-consuming, which was especially inappropriate for district schools where the course was "short" (i.e. was studied for three years) (Tsirkulyar, 1864: 61). Thus, Ye.I. Beyer did not deny the value of the opinion shared by the participants of the Kursk teacher congress but argued against absolutizing it, against recognizing the opinion as the only right one and without alternative.

As a result, the major part of Ye.I. Beyer's opinion on the Kursk teacher congress considered extremely specific issues, such as how to teach children specific mathematical operations, how to introduce the "parallel lines theorem," etc. (Tsirkulyar, 1864: 61-63). Thus, the text turned out not to bring the discussion to a conclusion, but clarify the pedagogical principles and rules, commonly adopted among mathematics teachers in the Kursk governorate, and the clarification was insignificant, except for the question of more efficient pedagogical methods.

### 4. Conclusion

So, public speeches on how mathematics should be taught, published in the circulars of the Kharkov Educational District for 1863–1864, enable us to understand both how the process of teaching arithmetic and geometry was organized in district schools and what pedagogical views the process was built on.

1) There were no fundamental problems in teaching mathematics at the time, as teachers themselves believed: while in the same 1863, issues of teaching language arts and geography provoked hot debate in the Kharkov Educational District, initiated by ordinary teachers, discussion on teaching arithmetic and geometry was initiated by the authorities as part of the second teacher congress in Kursk (May 12–18, 1863).

2) The congress showed that there was no absolute unanimity among district school teachers on general pedagogical issues – some of them thought that district schools should focus on teaching specific professions, while others insisted on their general educational nature, some stood up for the "Socratic" method of teaching (through the teacher-student dialogue), while others for "acroamatic" (through a teacher's monologue). However, speaking of the actual mathematics teaching practice, everyone was satisfied with the opinion that it should be practice-oriented without specialization: children were supposed to be taught using hands-on examples ("An explanation should necessarily begin with a practical question"), but without a focus on training for a specific profession. Moreover, according to the review by Kharkov University professor Ye.I. Beyer, all the congress participants who wrote individual reports had already employed the teaching technique.

3) No good mathematics textbooks for district schools were available at the beginning of the 1860s, but the point was not so much in conceptual problems as in the fact that the best textbooks were expensive and as a consequence there was no possibility to provide them to all children. For this reason, the absence of was not an urgent issue, and the teacher congress considered it possible to buy new textbooks only for teachers, so that they could use them in their activities.

4) There were no fundamental division in matters of teaching mathematics either between the participants of the second teacher congress in Kursk, or between them and the professor of Kharkov University Ye.I. Beyer, who provided his written opinion on the congress. Therefore, if there was some debate between all of them, it dealt either with general pedagogical issues, or, on the contrary, extremely specific issues, such as how to cover a specific topic in the best possible way.

The situation stood in stark contrast to the situation around teaching methods of Russian language arts and geography, which developed not even in district schools, but in gymnasiums of the Kharkov Educational District in the early 1860s. And this allows us to conclude that the progression in teaching methods for various subjects varied greatly, at least in the peripheral

regions of the Russian Empire. While the generally accepted methods of teaching language arts and geography just took shape in the Kharkov Educational District in the early 1860s, the situation with teaching mathematics was much better. An explanation might be exactly that the mathematics course could be directed to practice and designed with pupils' practical needs in mind – but the issue still requires further research.

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