

ACTA PEDAGOGICA NATURALIS

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The competency approach in the training of the future natural science teachers

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Abstract: *The competency approach is a promising path for improving the quality of education and life of the modern man. It is fundamental to the realization of the new educational paradigm. Its application in the training of future natural science teachers requires the creation of real professional situations that form the expected professional competences. The accent in the preparation of future teachers should be shifted to the process of knowledge with the realization of active cognitive activity of the students themselves.*

Keywords: *competency approach, natural science teachers*

Introduction

The new educational paradigm reflects the demands of a new society, built around an organization and stimulated by information, based on the explicit acceptance of democratic values and human rights. Today, every member of the civil society should be a participant and to construct his or her own personal and professional behavior.

This also applies to the Bulgarian teacher. In the modern society there is a change in the expectations of its activity, with the new perspective is complex and multilayer. The teacher should demonstrate and apply a mastered minimum of complex knowledge in a given scientific field and various didactic technologies in the constantly changing variety of pedagogical situations. The teacher should work for the formation of qualities in students like initiative, entrepreneurship and to form key competences, also to support their personal development and implements the ideas of inclusive education. In his professional development, he should fulfill a complex of professional roles and to implement different levels of interaction, in which he applied various professional competencies.

As with any other profession and in teaching the requirements for its implementation should be described by the respective professionogram. According to Vasilev and Merdzhanova, the components of the professionogram are the medical record, which indicates the requirements for health and the corresponding contraindications; the psychogram – the requirements of the profession to the psyche of the one who will exercise it and its limitations; Sociogram - the requirements for the social pedagogical image of the one who will exercise it and the limitations for its successful realization [21, p. 68- 69].

Related to the teaching profession, out of the components of the professionogram mentioned above, we will outline the basic directions of dimensions of psychogram and sociogram, which specify specific requirements for current teachers and for the preparation of future ones. According to Slavova, in the psychogram of the teaching profession, should include those minimum requirements of the profession for mental state of those who elect and those who practice the teaching profession, which would affect the mental state of the trainees. The sociogram of the teaching profession should include the basic socio-moral characteristics (qualities) of the person who chooses to prepare to be a teacher, as well as of the person who practices the teaching profession. As a component of the teaching profession's professionogram, a set of basic requirements for his / her vocational training and qualification should be present. The substantiation of a reliable teaching profession professionogram would help to optimize the processes of selection, academic preparation and professional realization of Bulgarian teachers [19].

The requirements mention above are relevant not only for Bulgarian teachers, but also for all those who are working in the field of European educational institutions. Depending on the guidelines of national education policies, each country looks for ways to create and adhere to certain standards in the teaching profession that can help to solve some of the problems in the field of modern education. European Commission working papers on quality assurance of the education in the 21-st century state that the European Union faces new challenges due to the globalization. In order to be resolved, all citizens should be able to acquire key competences by making all levels of education and training more attractive and effective [22].

An important task of education today is the training of competent professionals, i.e., people with knowledge and skills by which can be fully realize in the chosen profession. This task can be accomplished by using *the competency approach* in training. The increasing competition between the parties in the labor market force the searching for mobile, initiative professionals capable of making optimal decisions in different situations and this is one of the prerequisites for its using. Another prerequisite is the requirement for professionals to have a set of vocational-educational capabilities that ensure their versatility. N. Tsankov and L. Genkova emphasize that the competence approach is related to the new educational model and its application leads to improvement of the quality of education, by making it practically oriented [20].

Perceived as the foundation for a new educational paradigm, the competency approach is gradually being developed throughout the public practice as a tendency for the development of the modern man through continuous, competence-oriented education for everyone in the constantly globalizing world. This trend is not only European but also global. The World Educational Forum requests all countries to sign the Bologna Declaration, which point to the competency approach in developing national educational standards projects.

These facts shows that the competency approach is perceived, developed and refined by the international scientific community as a promising avenue for improving the quality of education and life of modern man.

With the introduction of the competency approach in the field of education, the development of the problem of *teacher competences* begins. A considerable number of studies in this field are currently published. Also in some countries, such as the USA, Canada, Japan, Australia, Switzerland, Turkey and others, there is a regulatory framework regarding the formation and assessment of teaching competences.

In Bulgaria, the competences that the teacher must possess in the respective field are regulated in Appendix No. 2 to Art. 42, para. 2, point 1 of Decree No. 12 on the status and professional development of teachers, principals and other pedagogical specialists [11].

In order to achieve these competences, the Higher School has the task to create the conditions for the development of the professional competences in the students, which are future teachers, and to assist them to grow as specialists in their own subject. Students who are future teachers should be able to

navigate the innovation of pedagogical science, to design and organize a learning process at school through the use of different pedagogical technologies, that is, to develop themselves as competent specialists.

Materials and Methods

The purpose of this study is to define the theoretical foundations for implementation and to clarify the role of the competency approach in the training of students in the subject of Pedagogy of training in Natural Sciences at the Faculty of Natural Sciences in Shumen University.

The research methods used are analysis of pedagogical, psychological and methodological literature and comparative analysis.

Results and Discussion

Competencies – Competence

The competence orientation of the educational process is directed towards goals which are related to motivation, self-determination, socialization, development of individuality. Tools for achieving these goals are new educational concepts like competencies, competence, professional competence and others.

One of the problems that a researcher in the field of competence has paid particular attention to in the 1990s is related with the distinction between the terms "competencies" and "competence". The use of the two terms leads to confusion, which most of them consider undesirable during this period. According to M. Armstrong, the mixing of the two terms initially began in the UK, and subsequently some authors began to regard them as synonymous. M. Armstrong distinguishes the two terms as follows:

- competence is a human-related concept that refers to aspects of behavior behind competently performed work;
- competencies is a job-related term that speaks to the field of professional activity in which a person works [By 5].

Considering this problem, it should be noted that in the psycho-pedagogical and methodological literature studied today we do not find a consensus on the definition of the concepts of competence and competency [16, 3, 9, 17, 20]. Part of the authors, to whom we adhere to, define competencies as "... a necessary result of the trainees' educational activity, which includes not only knowledge but also learned methods of action, personal qualities necessary for productive activity" [20].

According to V. Naydenova, **competency** is "... a mastered set of interrelated personal qualities (knowledge, skills, habits, methods of action) referring to a certain range of objects and processes necessary for productive activity" [16].

In the EQF, competencies are seen as 'comprehensive mastery of specific knowledge, skills and behavioral models in a flexible way. Competencies are an individual's readiness to effectively organize internal and external resources to achieve goals and his / her ability to accomplish a particular class of professional tasks [1]. Therefore, competencies are the result of the trainees' educational activity, which includes not only knowledge, but also the learned methods of action and personal qualities which are necessary for productive activity.

Competencies can also be understood as a capacity for self-organization. This is every action in situations of discovered problems and complex systems. The general ability to be active and creative, reflexive of yourself, technical and methodical to environmental conditions and communicative with others.

There are different definitions of the concept of **competence** as well.

Russian teacher V. A Hutorski defines competence as "... a set of personal qualities of a student (value-meaning orientation, knowledge, skills, habits, abilities), conditioned by the experience gained from his activity in a certain socially and personally meaningful sphere. Students competence implies to a minimal experience for applying competencies" [7]. In the European qualification framework competence' means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development [1]. It is formed on the basis of cognitive properties and on the valuable practical experience of the person, allowing the effective solving of the problems and defines the person as competent to a certain extent.

According to the International Council for Standards and Training, Performance and Teaching, a competence includes an appropriate set of knowledge, skills, and attitudes that enable an individual to

effectively perform the activities of a profession, or to work in a manner that is appropriate or exceeds the standards in a particular profession or work environment [18].

According to Ya. Merdzhanova, "The dual complex of competence - competencies characterizes two interrelated aspects of human professional activity. The competence is used when we have to characterize the specialist's professional-personal profile and the quality of his attitude towards the subject of his professional work. While competencies fixes professional powers for certain professional activities and functions that are attributed to the specialist with exactly this certificate and exactly for this position and position in the professional hierarchy" [10].

Competence also manifests itself as "... an integral characteristic of the individual, as a system of competencies structured in a particular way and integrating knowledge, skills, and the individual's attitudes toward himself, others, to his activity and results" [20]. Adhering to this interpretation for the realization of the purpose of this study, we specify that the system of competences should be complex and to include those that guarantee the successful preparation and professional realization of future students as natural science teachers, as well as the positive attitude of students in the future pedagogical communication for realization of positive pedagogical activity results.

Nowadays particularly relevant in secondary education are *key competences*, they are part of the recommendation of the European Parliament and of the Council of the European Union to provide key competences for all, as part of Member States' lifelong learning strategies. The eight key competences defined in the European Framework of Reference for Key Competences are crucial for human development and are needed for their personal realization and development, adaptability to the constantly changing labor market, social inclusion, sustainable lifestyles and active civic participation.

The overall concept of the place and role of key competences in Bulgarian schools training is presented in the National Lifelong Learning Strategy 2014-2020. One of its main tasks is to encourage the acquisition of universal key competences such as learning skills, initiative and entrepreneurship, cultural awareness, and the so-called "Soft skills" (the ability to work in teams, to make decisions, to resolve conflicts, etc.). It also emphasizes the holistic approach of acquiring nine key competences for lifelong learning in a common process [15]. These competences are designed in the Law on Pre-school and School Education and they are the same as these in European Framework of Key Competences. There are one additional competence added to the Law on Pre-school and School Education – "skills to support sustainable development and a healthy lifestyle and sport" [23].

The subsequent ordinances for the implementation of the law do not explicitly specify the expected results for the development of the nine groups of key competences at the end of each educational stage. This leads to the lack of a unified approach to their inclusion in the different subject's curricula. In them, the selective attachment of certain competences to specific subjects does not imply their full implementation in the teaching process and partially limits the freedom and motivation of the teacher to form those competences in his students, which he identifies as important to them.

The key competences are subject to partial assessment only with regard to National External Assessments in grades IV, VII and X and due to that fact their importance is partly undermined. There are other unclear issues regarding the concrete implementation of key competences in the real learning process, which speaks of incomplete coordination between the learning content and the expected training results and creates additional obstacles for teachers to develop competences due to their lack of real interweaving with the syllabus. The curricula lack the precision of the proposed activities for their acquisition, there is a mix of competences in the respective subject with key competences, and there is a repetition of the same activities in the programs of different classes and school subjects.

There is a lack of a comprehensive concept for the inclusion of key competences in the learning process at school and in the analysis of the National Teacher Development Strategy 2014-2020 [14]. The National Teacher Development Strategy 2014-2020 does not deliberately mention the need for teachers' qualifications to be oriented towards the development of these knowledge and skills that the teacher needs in order to develop key competences in his students. Key competences are mentioned only in relation to the development of teachers' personal competences but not in the formation of such competences in students [8].

The same conclusion can be made with regard to the Decree on State Requirements for the acquisition of professional qualification called "teacher" [12]. In the Decree there is a lack of specific requirements for incorporating key competences in the preparation of future teachers. This is left to the discretion of universities as part of their right to independently develop and implement curriculum. After all the application of the competency approach in secondary and tertiary education is essentially its alignment with the new conditions and trends and a manifestation of its strategic orientation towards self-renewal.

Professional and pedagogical training of students

In the context of the competency approach, the vocational and pedagogical preparation of students - future teachers are a problem of particular relevance due to its social and pedagogical importance. The formation of professional competences in students is realized through theoretical (general scientific, psycho-pedagogical and didactic) and practical training in the compulsory and elective courses, set in the curriculum of the respective specialty.

In accordance with the National Qualifications Framework of the Republic of Bulgaria (NQF), which is compatible with the European Qualifications Framework for Lifelong Learning, adopted in 2012, the acquisition of a qualification called teacher takes place upon receipt of Level 6: Professional Bachelor degree – Sub-Level 6A and Bachelor degree – sublevel 6B.

In the NQF, the competences are structured in 4 subgroups: independence and responsibility; competences for learning; communication and social competences; professional competences (Fig. 1). The formation of these mentioned the last requires the Bachelor degree to have the competence to: "collect, classify, evaluate and interpret data in the field in order to solve specific tasks; apply acquired knowledge and skills in new or unfamiliar conditions; shows the ability to analyze in a broader or interdisciplinary context; uses new strategic approaches; forms and expresses own opinion on problems of social and ethical character arising in the process of work" [13].

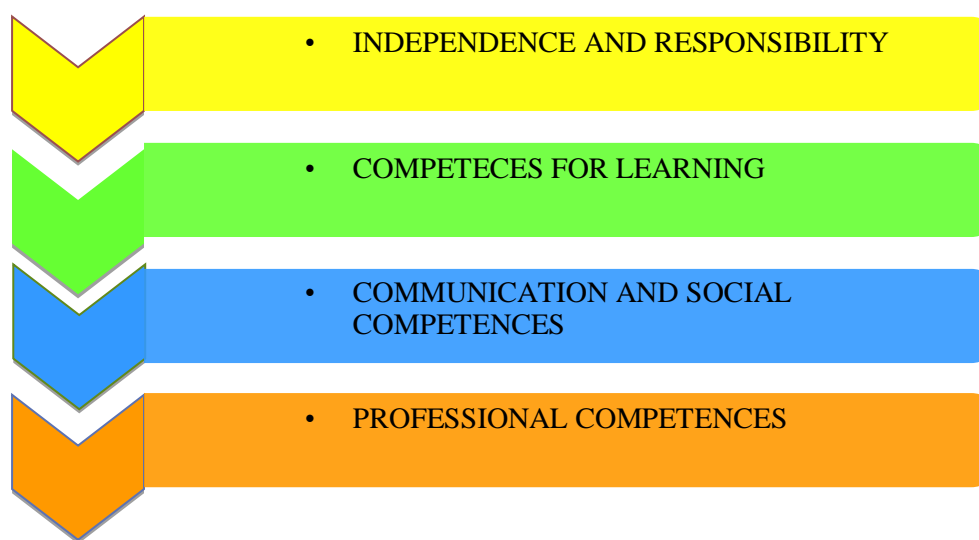


Figure 1. Subgroups of competences according to the national qualifications framework

The aforementioned professional competences are commonly formulated and find concrete expression in the Decree No. 12 from 01.09.2016 on the status and professional development of teachers, principals and other pedagogical specialists, as well as in the educational documentation of pedagogical specialties in the respective higher education institution [11].

In Appendix No. 2 to Art. 42, para. 2, point 1 in Decree No. 12 regulates the competences that determine the professional profile of the teacher - academic competence; pedagogical competence; communicative competence and administrative competence (Fig. 2). The respective knowledge, skills and attitudes are also associated with them.

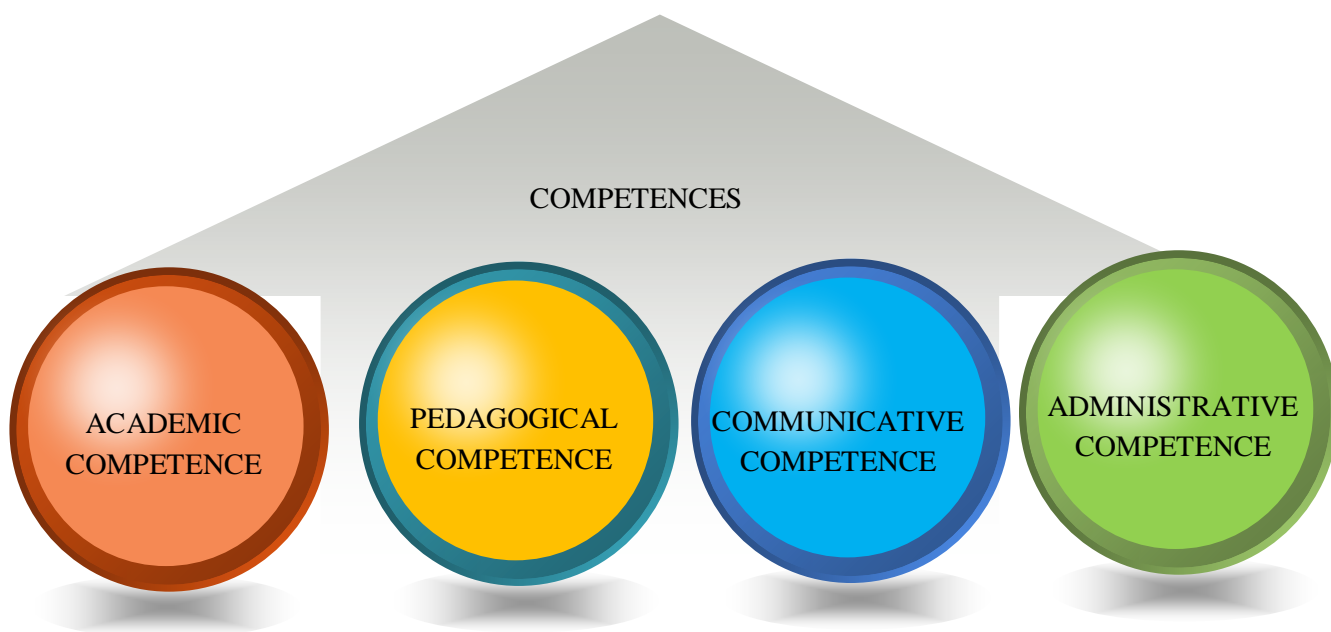


Figure 2. Competences defining the professional profile of the teacher

Academic competence includes initial vocational training (pedagogical, psychological, methodological, specialized) and lifelong learning skills. This is the part of teacher preparation that needs to be built within university education. Special attention will be given to it in the analysis of the educational documentation for the preparation of the future natural science teachers at the Faculty of Natural Sciences of the Shumen University.

Among the set of regulated competences that determine the professional profile of the teacher the *pedagogical competence* stand out, which is an important basis for successful professional realization. It implies formation of skills for lesson planning, organizing and directing the educational process, assessing student progress, and managing processes in separate groups or classes. The formation of this type of competence is closely linked to the basic pedagogical preparation of future teachers. It is given special attention and is seen as a decisive factor in achieving the quality of education [2]. Studies are being conducted in Bulgaria to determine the current state of the basic teachers training, which establishes the necessity of developing and validating a unified and not contradictory system of basic pedagogical training and qualification in accordance with the needs of the society in the long term and with contemporary achievements and trends in European scale [6]. Undoubtedly this will have impact on the requirements for the training of teaching staff in the universities.

Communicative competence is a set of communication skills for adequate communicative behavior by participating in different communication activities and the implementation of different communication situations in the pedagogical process. It involves not only knowledge and skills for communicatively adequate behavior, but also personal and professional skills for dealing with the challenges of school daily life. It includes a set of communication knowledge and communication skills under the changing conditions of communication with modern students. In the context of pedagogical professionalism, communicative competence is most closely linked to the other types of competence and two individual aspects of it can be distinguished – basic communicative competence and professional communicative competence [4, p. 114].

Administrative competence is related to the legal and ethical issues of a teacher's professional activity. According to them, the teacher should recognize and to apply the legal framework of the school education system, to comply with the legal norms that are relevant to professional rights, obligations and its employment relationship.

At the same time, it must be sufficiently acquainted, in order to apply the National educational standards for the information and documents, educational and school documentation of the educational institution, the terms and conditions for its adoption, creation, keeping, reporting and destruction. In

his/her administrative activities, the teacher must respect professional ethics and, if necessary to counteract illegal, corrupt and other acts that undermine the prestige and reputation of the educational institution.

All the theoretical aspects of the competency approach that are analyzed determine the necessity of its application in universities in the preparation of future teachers. At the same time, they also put certain challenges, which are related to a number of difficulties regarding to its complex nature and the necessity to upgrade the basics that are built in secondary school.

The specialty "Pedagogy of Natural Sciences Education" at the Faculty of Natural Sciences of the Shumen University is one of the newest. The training in it starts in the academic year 2019-2020. Its main purpose is to prepare competent and competitive teachers in the following school subjects: Man and nature, Physics and Astronomy, Chemistry and environmental protection, Biology and health education. They should be able to carry out educational, scientific, methodological and organizational activities in the educational system in accordance with the specialty obtained. The bachelor's degree teaching documentation designs the requirements of the competency approach and is reflected in the qualification characteristic by highlighting the following competencies of the future natural science teachers – personal, professional, instrumental and technological.

In order to achieve the purpose mentioned above, the training focuses on the formation in the future teachers of knowledge, skills, vocational and pedagogical competences, motivation for lifelong learning, the ability and striving for continuous self-improvement and self-education that are necessary for ensuring a quality educational process.

Along with them, in the course of the educational process, students work to build personal competences that provide the future specialist with the opportunity to adapt to the conditions and requirements of the professional environment, as well as for their own further professional development: language culture, computer literacy, skills to work in an intercultural environment, teamwork skills, ethics, and tolerance.

In the qualification characteristic of the specialty have been specified the general professional competences defined in the NQF. In their direct professional activity, graduates in the specialty of the Pedagogy of Natural Science in Bachelor's Degree must have the following competencies:

- to plan, organize, analyze and manage competently the educational process;
- to select the optimal set of approaches, methods, tools and forms for the realization of a modern learning process;
- to use modern technologies for diagnostics and evaluating the quality of the educational process;
- to process and analyze the results of the control of the indicators that determine the level of students' preparation;
- to develop and implement methodological models, methodologies, technologies and training techniques;
- to plan, organize and conduct extracurricular forms of work;
- to work in a team with colleagues in realization of interdisciplinary organizational forms;
- to realize scientific and applied researches, to summarize their experiences and to participate in scientific forums.

Based on the understanding that the competences are result of training, the educational process at the university should be organized in such a way as to create real professional situations in which the expected professional competences are formed in future teachers. Thus, in the educational process based on the competency approach, a certain connection is established between knowledge and skills, the subordination of acquired knowledge to professional skills, which contributes to the fact that education becomes personally important for the student (Fig. 3).

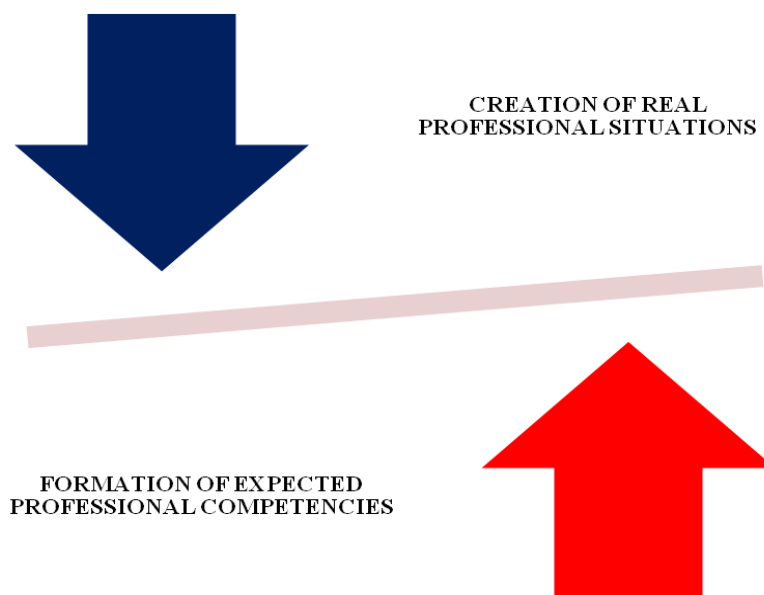


Figure 3. Competencies as a result of university education

The change in the organization of the learning process is a necessary but far insufficient condition for the formation of professional competences in students. Equally important issue is the choice of forms and methods of training. One of the main characteristics of graduates in the pedagogical specialties is their mobility, the ability to independently acquire knowledge and quickly to navigate in the innovative processes in education. Therefore, the emphasis in their preparation should be shifted on the process of knowledge, the effectiveness and efficiency by which the active cognitive activity of the student depends. The competences formed in this case depend not only on the theoretical knowledge acquired by the trainees during their education, but also on how they acquire this knowledge: based on memorization or through the development of thinking, by using reproductive or active methods and forms of teaching.

Conclusions

Based on the above, we can summarize:

- The competency approach is perceived, developed and refined by the international scientific community as a promising way for improving the quality of education and life of a modern person.
- The competency approach is fundamental for the realization of a new educational paradigm for development of modern man through continuous, competence-oriented education for each one and all in the globalizing world.
- With the introduction of the competency approach in the field of education, the development of the problem of teacher competences begin, which are complex and varied with a view to a successful professional realization.
- We adhere to the view that competencies are necessary result of the educational activity of the trainees, which includes not only knowledge but also learned methods of action, personal qualities needed for productive activities.
- The system of competences for the training of future natural science teachers is complex and includes those that guarantee successful preparation and professional realization, a positive attitude in the future pedagogical communication for the realization of positive results of the pedagogical activity.
- It is necessary to create conditions for inclusion of the key competences in the preparation of future natural science teachers.
- The formation of professional competences in the students trained in specialty of pedagogy of natural science education is realized through theoretical (general scientific, psycho-pedagogical and didactic) and practical training through compulsory and elective disciplines included in the curriculum of the specialty.

- The professional profile of the natural science teacher is defined by academic competence, pedagogical competence, communicative competence and administrative competence.
- In order to realize the competence approach, it is necessary the educational process at the university to be organized in the creation of real professional situations in which the expected professional competences will be formed in the future science teachers.
- The emphasis in the preparation of future teachers should be shifted to the process of knowledge, the effectiveness and efficiency of which depends on the active cognitive activity of the students themselves.

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Study on students' readiness and satisfaction with the use of online information technology capabilities as a tool for control and assessment in chemistry and environmental protection education

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Abstract: *Over the last decade, the capabilities of information technology in the field of education have grown significantly. A large number of platforms have been created with different functionality regarding the training, sharing and dissemination of information in the form of reports, abstracts, essays, videos, etc., as well as for carrying out different forms and types of control and evaluation. Some of these platforms are Google Drive, Moodle, Ucha.se, etc. Particularly noteworthy are those who provide opportunities for the teacher's personal intervention in creating relevant, tailored, and taught teaching content to form an appropriate testing and evaluation. However, education in the various disciplines of the high school curriculum becomes more and more inconceivable without the inclusion of the broad possibilities of the IT tools. In this paper, we report the results of our study on the attitudes students in high school education in the course of chemistry and environmental protection to use information technology tools as a tool for learning and controlling and evaluating academic achievement. Some conclusions about the degree of student achievement in the implementation of electronic forms of control and assessment have also been done.*

Keywords: *electronic tests; control and evaluation*

Introduction

The current rapid development of science and information and communication technologies, as well as changes in the socio-economic situation in the country, are increasingly posing a number of problems and challenges for education. Modern techniques and technologies lead to the creation and introduction

into practice of new forms, methods, techniques and means of training and upbringing, to a new way of pedagogical thinking and pedagogical attitude. The development of traditional subjects in the compulsory high school education course seems almost unthinkable without the use of information technology capabilities, especially if the purpose of this training, apart from mastering the compulsory material, also involves attracting attention and creating lasting interest in learners. Each discipline in the compulsory curriculum can be made more accessible, attractive and develop greater opportunities for teaching, learning and self-assessment, with the intervention of the IT toolkit. Unfortunately, the use of this tools, especially in its control and evaluation part, is poorly practiced. Useful developments and examples regarding the application of various accessible online platforms in the assessment process of trainees in various fields of natural sciences are almost absent in the scientific literature. The examples available in the literature are mainly related to the developed distance education courses in higher education [1, 2].

A poorly used practice in modern high school is the use of electronic tests to control and evaluate students' knowledge and skills. It is still rare to use a tablet, computer or smartphone as a test tool, and providing electronic tests to students on-line is a near-non-existent practice. As an assessment tool in the course of chemistry and environmental protection, the application is considered in this development of electronic tests as a means to improve the organization of control and assessment of students' knowledge and skills and increase their average success. The Google Drive free online platform was used to create the self-assessment tests in this survey.

The purpose of this study is to demonstrate the capabilities of the Google Drive online platform for the development of electronic chemistry and environmental testing tests as a means of improving the process of control and evaluation of students' knowledge and skills and increasing their average performance.

Theoretical statement

Information technologies used to collect and evaluate responses in education are extremely applicable when they are introduced in on-line platforms. They make possible student access to tests, surveys, worksheets, etc. at anytime, anywhere. In addition, they can be used to monitor students' progress, facilitate feedback, and empower teachers to evaluate and adapt their teaching strategies and support decision-making. Some results of a study by Natasha Koleva show that Bulgarian teachers have not yet taken advantage of these opportunities, but have been informed of their potential [3]. The most common online platforms for collecting and evaluating answers are: Google Forms, Microsoft Forms, Quizzes, Envision play, etc. Google Forms add-ons help the workflow and facilitate the evaluation and processing of results: Flubaroo, Form Limiter, Teacher Rubric, etc. The first two supplements support the collection and evaluation of responses, and the third - the compilation of a summary/review. The rubrics actively encourage the self-assessment of the trainees, even while working on the assignment. They help teachers to justify the assessment [4].

Working with Google electronic forms significantly changes the habits of teachers' digital skills. Collecting answers from students in this way is unparalleled in previous ways, through tests, worksheets, test papers or classroom papers. Gathering answers through multi-mouse sessions or with real-time remote devices is different from doing tests with GoogleForms, namely - the question at one point is one for the whole class and is projected onto the wall, i.e., all students answer one question at the same time, which affects objectivity [5]. The model for working with an electronic form consists of the following steps: 1) Creating the electronic form; 2) Distribution; 3) Collection of responses; 4) Evaluation; 5) Publishing individual or summary results [5].

There is a wide variety of tools for each of the stages. Particularly interesting are the distribution opportunities, which is also attractive to students: e-mail, social network, social gated group, special site, virtual classroom, QR code, additional resource on the page of e-textbook, etc. For the teacher the methodical benefits are the following: evaluation of the response at the moment; group assessment at question level; group assessment at the level of the whole test (teacher's portfolio, entry/exit analysis, etc.); individual assessment at the whole test level; information on difficult issues; the ability to add a summary to the assessment; graphical representation through diagrams of the evaluated answers; the ability to send the evaluated test by email; ability to print the evaluated test individually or summarize the results; ability

to save the evaluated tests as a file; the ability to mix answers at question-level or all questions in the test, or both [5].

Working with electronic forms is a new skill in the digital literacy of pedagogical professionals. In addition, methodological knowledge of didactics in the field of control and assessment of academic achievement is needed, which makes information technology a powerful tool in the process of assessing students' competences.

Results and discussion

In order to study the applicability of electronic tests as a control and evaluation tool in the course of chemistry and environmental protection, a pedagogical experiment was conducted in the academic year 2018/2019 at the Dr Peter Beron High School in Varna with 9th grade students. The interviewed and tested students were 185. A survey model was made including electronic tests on the following sections; "Metals and their compounds", "Non-metals and their compounds", "Hydrocarbons" and "Hydrocarbons derivatives". The purpose of the survey was to examine the opinion and attitude of the students in the application of electronic tests in the process of control and evaluation during the course of chemistry and environmental protection. In order to increase the objectivity of the answers, the survey was conducted anonymously. The questions asked in the survey are as follows:

1. Do you enjoy playing on a tablet and/or smart phone?
2. Do you use modern information technology in other subjects?
3. Do you like lessons that use modern information technologies?
4. Do you think that you acquire knowledge more quickly when presented through the tools of modern information technology?
5. Do you remember more easily what you saw on your tablet or smartphone screen?
6. If you had free access to a tablet, would you play often?
7. Do you prefer the teaching content to be taught and controlled by the teacher using modern information technology over the classical lesson taught only by the teacher and conducting a paper test?
8. Does working with a tablet and a smartphone in chemistry classes improve your practical work skills?
9. Does a person need to be able to work with a computer?
10. If available at home, would you use electronic self-tests?
11. Do you think that you have been assessed impartially by the electronic test?

Each question was given the choice of five different distractors a) yes, a lot; b) yes; c) I cannot judge; d) not particularly; e) no. The students were given the opportunity to choose only one of these distractors.

Our survey has scaling answers on a symmetrical rating scale from 1 to 5: a) yes, a lot – $X_i = 5$; b) yes – $X_i = 4$; c) I cannot judge – $X_i = 3$; d) not particularly – $X_i = 2$; e) no – $X_i = 1$.

After mathematical processing of the results on the symmetric scale system, we obtained data on the frequency of the answers (f), the relative frequency of the answers ($f\%$) and the weighted average of the answers to a question (X_{pr}), which also determined the conclusions for the opinion of students for using electronic tests as a means of control and evaluation of course of chemistry. Specific results after processing the questionnaire were obtained in the following aspects:

For the attitude of students to modern information technologies - the value of $X_{pr} = 3.97$ and is calculated on the basis of the formula:

$$X_{pr} = \sum X_i \cdot f / \sum f, \text{ where:}$$

$\sum f$ - sum of the frequency of the answers encountered;

$\sum X_i \cdot f$ - the sum of the product of the number of students, whether the corresponding answer and the value of the corresponding X_i of the rating scale.

X_{pr} values on this issue (3.97) reveal a positive attitude of students towards modern information technologies.

For the students' attitude towards the use of information technologies in the educational process, the data are presented on figure 1, reflecting the relative frequency of the respective answers.

X_i	f	F%	X_{pr}
1	2	16.67	3.42
2	1	8.33	
3	2	16.67	
4	4	33.33	
5	3	25.00	

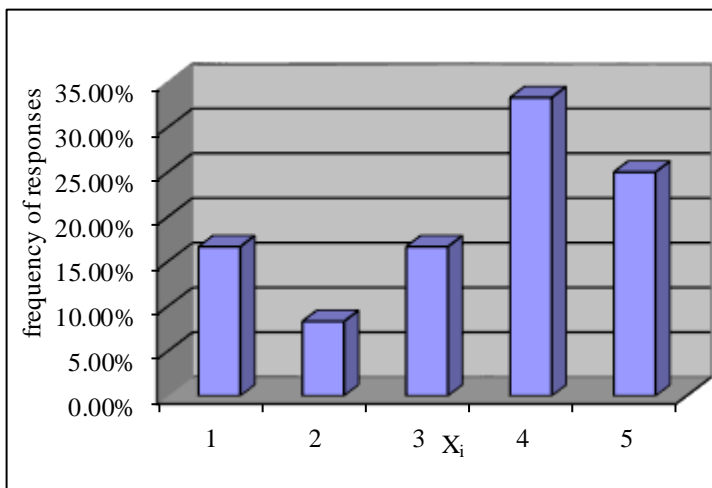


Figure 1. Using of information technologies

The processed results confirm our observation that when conducting an electronic test, students like this control method, consider it more impartial and prefer it to a paper-based test.

For the speed of perception of the received information the data are presented on figure 2.

X_i	f	F%	X_{pr}
1	1	8.33	3.66
2	1	8.33	
3	3	25.00	
4	4	33.33	
5	3	25.00	

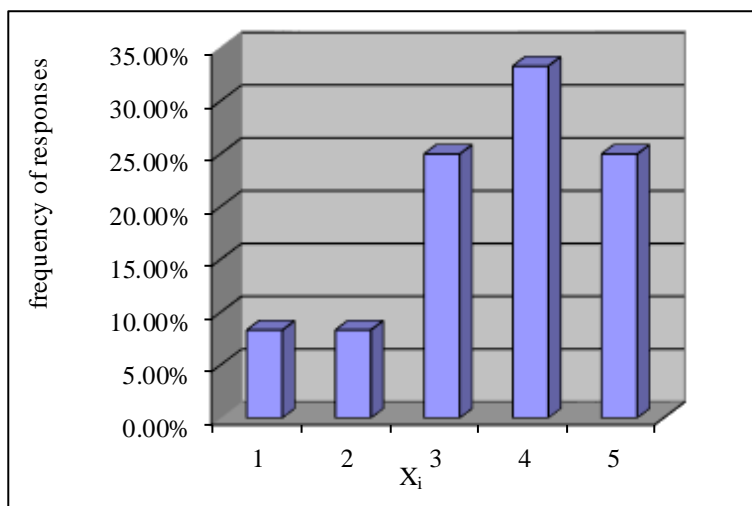


Figure 2. Speed of perception of the received information

The results show that 58% of students find their knowledge easier and more relaxed if the test is performed with a tablet or smart phone.

In order to develop practical skills, the survey data shows that students have a good command of information technology and chemistry lessons are elementary to them and do not carry additional practical skills. Only 33.33% of the students think that their skills are improving, 25% cannot judge, and about 42% believe that their skills are not improving. This leads us to believe that the potential of students has not been fully utilized and it is possible to increase the share of working independently with a tablet and a smart phone in chemistry and environmental protection classes. It is also possible to switch completely to self-study through appropriately tailored training programs. The results are presented on figure 3.

X_i	f	F%	X_{pr}
1	1	8.33	3.50
2	2	16.67	
3	2	16.67	
4	2	16.67	
5	5	41.66	

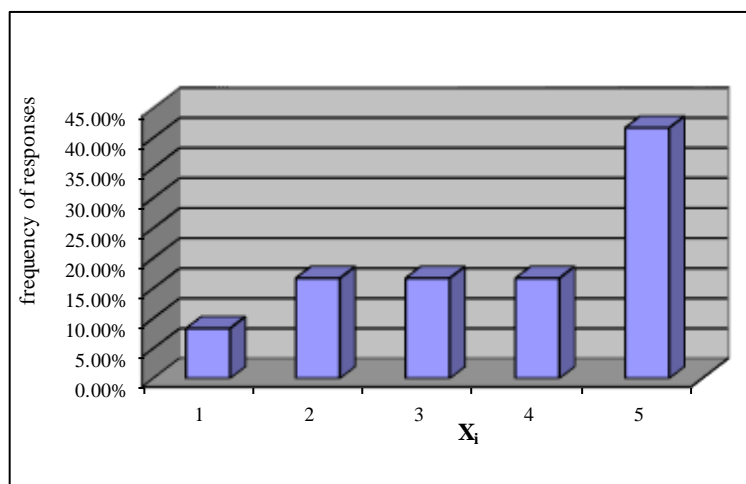


Figure 3. For the development of practical skills

When analysing the results of the survey, it is noticeable that those students who have expressed a positive attitude towards the tablet and smart phone and their application in education, more easily perceive and remember the knowledge taught and controlled through modern information technologies.

The research we conducted on the possibilities of using electronic tests as a means of control, self-control and evaluation gave positive results. The average success of students in conducting electronic tests increased, their knowledge and skills improved. The students showed a positive attitude towards conducting tests with an "impartial" assessor in the face of a tablet and smart phone. In addition, they expressed a positive attitude to the ability to use the test as a self-control at home when the test is being performed on-line in Google classroom.

Conclusions

Nowadays in the dynamic information technology environment, the learning process needs to be innovative in terms of methods, tools and technologies so as to prepare young people for a different environment of realization and quality of life. The use of electronic didactic tests in chemistry and environmental protection course leads to an increase in success and improvement of the level of knowledge and skills of students in the subject matter taught, contributes to the more lasting absorption of knowledge and skills and their future application in practice.

Independent use of a tablet and smart phone during the test leads to improved quality of control by introducing an "impartial" machine that assesses students' knowledge and skills, which makes the control objective and gives students a positive attitude towards the material taught and the learner. Last but not least, conducting electronic tests via a tablet and smart phone improves students' digital competence in completing their high school education.

Of particular value to the dynamic electronic test is its ability to be used as a means of control simultaneously by a group of students, as each of them receives a separate set of questions randomly selected from Google Drive, and in the event of a coincidence, no exchange is possible between students because the order of distractors in the test changes with each restart. In addition, the test can always be supplemented with new questions.

The ability of the online test to be used as a tool for self-study or self-control by students makes it a modern learning tool, which should be applied in the new modern school of the 21st century.

The experimental work carried out and the results obtained from the pedagogical research justify the following conclusions:

1. The course of Chemistry and environmental protection in grade 9th degree provides opportunities for the use of electronic tests in the learning process and for generating interest in the subject.
2. The goals set at the beginning of the study were met above 80% in conducting the electronic tests, with the average student achievement in the experimental group having increased to the Very Good 5.34, which we take as a measure of the effectiveness of the method.

3. Conducting electronic didactic tests increases students' interest in the subject because it positively influences their view that their knowledge and skills are properly and impartially assessed by the computer and not subjectively by the teacher.

4. Selective answer questions are appropriate to test students' knowledge of the first level of competence. This type of task is preferred by the students.

5. It is of particular interest to use the test as a tool for self-study and self-control, especially by students who were absent from teaching the relevant teaching material. This quality of the test has another positive side - it can be used by self-study students who for health or other reasons do not attend the classes, i.e. the test is a "harbinger" of the possibility of organizing distance learning in the high school stage of secondary education.

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Didactic aspects of geography and economy training in modul "Modern economic development"

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Abstract: *The article presents didactic aspects of geography and economics training in the compulsory module "Modern Economic Development". It is made a content analysis and situational analysis of the profiled preparation in the second secondary school of secondary education was made according to the normative framework – law for pre-school and school education, state educational standard, curricula for profiled preparation. The place and didactic benchmarks for the Geography and Economics profiling subject and one of its compulsory modules in the three normatively determined profiles - Social Sciences, Economic Development and Entrepreneurial – are revealed. One of the compulsory modules of profiled geography preparation – "Modern Economic Development" – was explored in the semantic context of the fact that the module is a separate part of the relevant school subject.*

Keywords: *state educational standard, curricula, Modern economic development, didactic aspects*

"... the picture of the world is a unique image of the complex and immense reality that is unknowingly "born" and "branching" in our minds ... the pictures of the world are so identical to every individual outlook, this means that they are a product of the personal worldview. "

Atanas Dermendzhiev [1]

Geography and economics training from 2016 has been placed in new educational configurations and is normatively based on new laws, regulations and other by-laws documents. A total of 19 state education standards (DOS) have been introduced in the system of pre-school and school education as "a set of mandatory requirements for the results in the system ... and the conditions and processes for achieving them" [2].

The fifth of these total of 19 DOS is for profiled preparation.

The school education **regarding preparation** is *general, profiled and professional*, with "profiled education being carried out on a middle degree through general education and advanced preparation – in the first high school stage, and through general education and **profiled preparation** – in the second high school stage, where it can also be provided through advanced training." [2].

The school education **regarding contents** "is general, extend, **profiled**, professional and additional." [2].

The Law on Pre-school and School education (ZPUO) regulates the scope of profiled preparation – "in-depth competencies in a profile, defined by the state educational standard for profiled preparation", with the profile "being a complex of profiling school subjects, two of which are defined with the state educational standard..., and the rest are determined by the school with the school's curricula and are the same for grades XI and XII" [2, 3].

School education **profiles** are generally 11: 1) foreign languages; 2) humanities sciences; 3) social sciences; 4) economic development; 5) software and hardware sciences; 6) entrepreneurial; 7) mathematical; 8) natural sciences; 9) fine arts; 10) music; 11) physical education and sports.

The profiling school subjects that are determined by the DOS to study for a given profile are a total of 15, as a serial number seven is written the profile **geography and economics**: 1) Bulgarian language and literature; 2) foreign language; 3) mathematics; 4) computer science; 5) information technology; 6) history and civilizations; 7) **geography and economics**; 8) philosophy; 9) biology and health education; 10) physics and astronomy; 11) chemistry and environmental protection; 12) music; 13) fine arts; 14) entrepreneurship; 15) physical education and sports [3].

Procedurally profiled preparation is localized for the acquisition of the second high stage of middle degree education by studying profiling school subjects in the given profile.

Since 2016, a DOS has been introduced in Bulgaria for the profiled preparation, as well as for the structure of the curricula, which are in response to the state educational policy and the consequence of the educational reform, which regulate the training including geography and economics, as a profiling school object (Fig. 1).

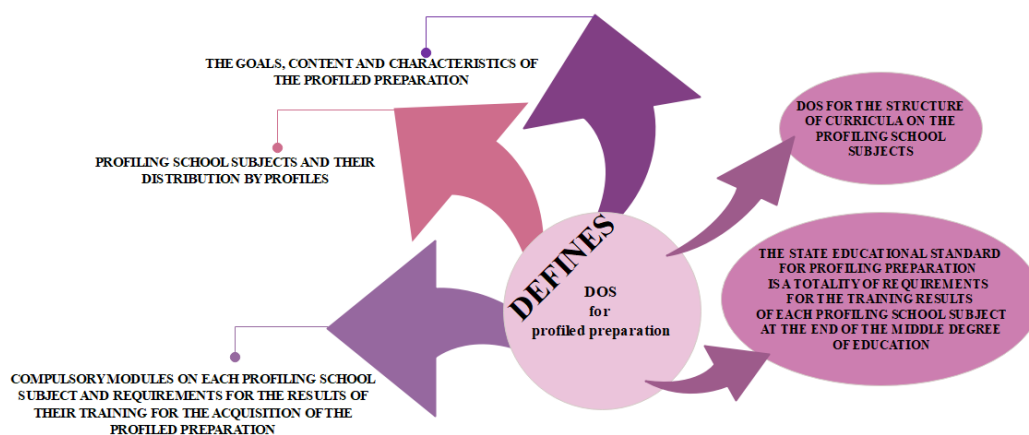


Figure 1. General scheme of DOS for the profiling preparation

The school subject *Geography and economics* is profiled for the classes in the second high school stage and consists of **compulsory and optional modules**, but the compulsory modules are determined by the DOS. Based on the DOS for the profiled geographical preparation, curricula for the compulsory modules of the Minister of Education and Science have been approved. The optional modules provide for the acquisition of competencies defined in the curriculum, which are developed and validated at the level – from the Headmaster.

In this article, for the purpose of the study, we examine only the profiled geography and economics preparation for the compulsory modules, focusing on one module in the semantic context of the fact that "the module is a self-contained part of the relevant profiling school subject" [2].

The profiled school subjects are related to the profiles and cover "in-depth profiling subject and complex competencies for a particular profile" to Section B of the learning plan. There is also a specificity regarding the number of hours in the profiled preparation for the total number of hours – "at least 18 hours and a maximum of 20 hours per week during the whole training stage" [3, 4].

An important moment in the situational analysis is to identify the place of the profiling *geography and economics* school subject to which profiles are determined for studying at the national level, not through the school learnings plans. The procedural characteristics and specifics of the profiling school subject are the following:

- it is studied in the second high school stage of the middle degree of education;
- the profiling school subjects in a given profile are the same for grades XI and XII;
- each profiling subject is studied with a minimum of 4 hours of study and no more than 8 hours per week;
- it is compulsory for two profiled school subjects to be defined at national level [3, 4].

The normative specificity of the profiled preparation, which is the development of the educational policy for continuing education, is the possibility the results of the training in specific compulsory modules for the acquisition of profiled preparation as accumulated credits in the higher education (by decision of the higher education institution).

The line of continuity, upgrading and professional development of school knowledge to the academic ones is clear in integrating the school process and the transition to the next educational degree of students with an interest in the geographical science.

The school subject *Geography and economics* is part of three profiles (out of a total 11 profiles) in which one of the two compulsory profiling school subjects is imperative (Fig. 2).

It is undisputed the fact that the profiling subject - geography and economics is defined at national level, together and in totality with other profiling school subjects that are part of one profile, because "the profile is a totality of three or four profiling school subjects, two of which are defined at the national level and the rest – by school learning plans" [3].

The presence of the school subject *Geography and economics* in the compulsory module of a particular profile does not close it within only these three profiles, but in fact the DOS gives the opportunity to one profiling school subject to be part of the optional modules in each of the profiles of the school learning plan. This variability is for the benefit of every profiling school subject, but it is influenced by many and varied factors in its election at the institution level – school, and the choice is influenced by subjective reasons and not so much by objective ones.

The profiles in which geography present as one of the two required profiling subjects are three in total (Fig. 2):

- Social sciences;
- Economic development;
- Entrepreneurial [3].

The only profile that guarantees the unconditional presence and constancy of the profiling school subject *Geography and economics* for the profiled preparation is profile 4 – "Economic development". The other two profiles of *Social sciences* and *Entrepreneurial* offer electiveness and variability, in which one of the two options does not offer the profiled school subject geography and economics. Or, if you choose one of these two profiles, there is no guarantee of studying both profiling subjects that contains geography and economics.

The school subject *Geography and economics* as a compulsory general education and profiling builds the foundations of the social and civic competences in integrative synthesis with other school subjects of the social cycle – *Environment, Man and society, History and civilizations, Philosophy, Civic education*. This fact explains the presence of geography in the "Social sciences" profile, but also contradicts the determination of electiveness to philosophy, such as the variability of *History and civilizations*.

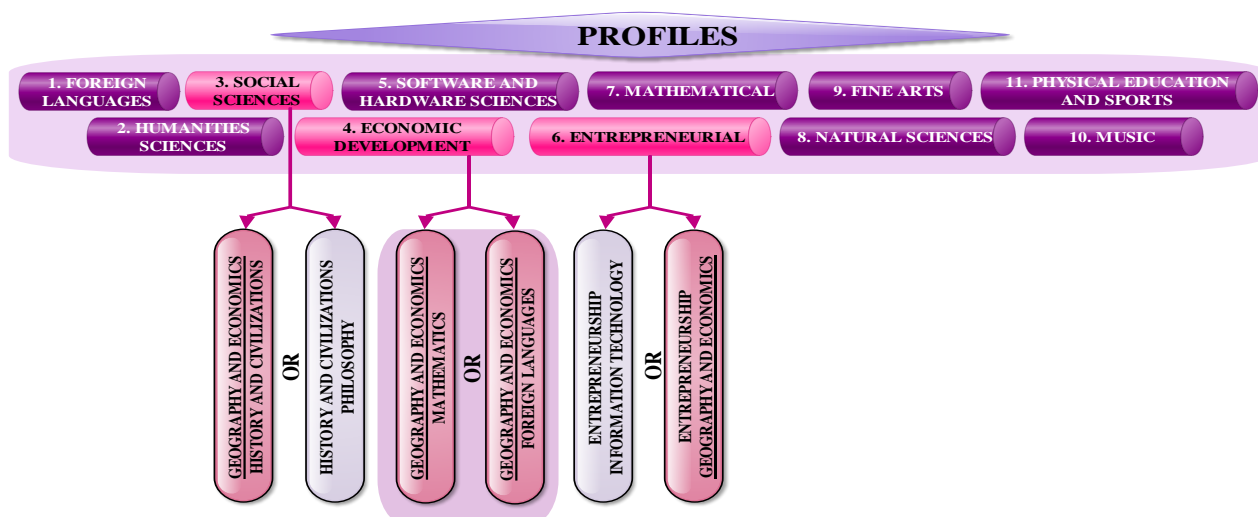


Figure 2. Place of the profile school subject Geography and economics by profiles

The normative opportunity for the study of geography and economics is extended and additional educational preparation, composed in school learning plans. Conditionally, schools, through their school learning plans, provide a specific vision for the study of geography, which suggests regional specificities as a result of the type of the school institution.

The educational policies at the regional level in relation to extended and additional preparation in geography and economics have a great convention of conditionality and uncertainty in the introduction and for specific schools. The possibility of applying the two types of preparation is framed by many determinants of different dimensions – educational, social, economic, transport, infrastructure, cultural, scientific, etc.:

- ↳ the opportunities and initiative of the school management to offer an educational product with a new vision and content;
- ↳ the existence of lobbies in pedagogical teams regarding to given profiles;
- ↳ the qualification and the educational qualification of the teachers;
- ↳ the professional opportunity of educators to create and develop innovative, integrative and school-specific learning plans and programs;
- ↳ good knowledge of the normative base for drawing up school learning plans – characteristics, content, structure, etc. procedural requisites;
- ↳ discussion and acceptance by the Pedagogical council;
- ↳ the educational traditions of the particular school and the importance of the institution to the region;
- ↳ the capabilities of the school in terms of material and technical facilities, location, authority, etc.;
- ↳ the desire and interest of students, parents, guardians and the public need for such type of training as relevant to the public needs and the labor market;
- ↳ the personal motivation of teachers, students and the management of the school institution, comprehension and awareness of the benefits of this type of training;
- ↳ coordination with the Public council to the school under the terms and conditions of the ZPUO, etc.

For the full disclosure of didactic aspects in geography and economics training in profiling preparation, the normative constructed structure of the DOS for **specific purposes, compulsory modules and areas of competence and expected training results** is relevant (Fig. 3). The didactic model of education in geography and economics by educational degrees and stages "opens a logically and systematically linked line in the area of competence, with a clear and open continuity and a deepening of the structural-content and methodological-didactic level" [5].

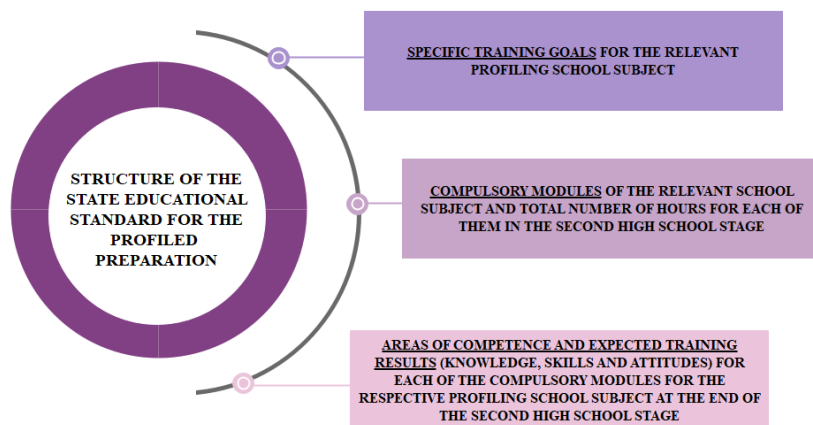


Figure 3. Structural DOS model for each profiling school subject, including geography and economics

The requirements for the results of the training in geography and economics for the acquisition of profiled preparation are presented in the DOS with specific goals, didactically modeled for the improvement of *knowledge and skills, for the development of the geographical culture and the formation of behavior models* (Fig. 4).

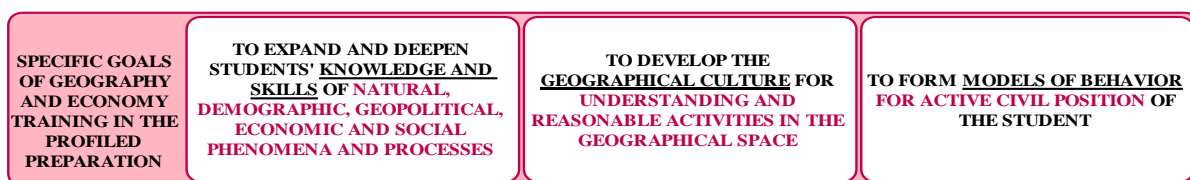


Figure 4. Specific goals of geography and economics training – profiled preparation

The compulsory DOS modules are a **total of 6**:

- ⊙ Module 1 – Natural resource potential. Sustainable development (36 hours);
- ⊙ Module 2 – Geopolitical and social culture (36 hours);
- ⊙ **Module 3 – Modern economic development (36 hours);**
- ⊙ Module 4 – Europe, Asia and Bulgaria (36 hours);
- ⊙ Module 5 – Bulgaria and regional policy (62 hours);
- ⊙ Module 6 – Geographic and economic information (62 hours).

The imperative normative framework requires the compulsory modules to be studied in the XI class with 144 school hours per year and in the XII class – with 124 school hours per year. The fixed annual hours of classes for the two classes in the second high school stage are a reflection and a necessity to cover the requirements of the modules, as *"a self-contained part of the profiled preparation in the respective profiling school subject, aimed at upgrading the competences acquired in the general preparation, and to in-depth competencies in specific scientific and/or applied fields"* [3].

This article explores only module 3 and presents the didactical aspects of Geography and economics training by area of competence *Geography of the society*. Module 3 meaningfully covers – the models and processes (globalization, regionalization, integration) of the modern economic development, the development of energy in the world and major energy projects, the influence of high technologies, international economic integration and the development of transnational corporations (Fig. 5).

A total of 6 expected results are listed in the DOS, introduced through five active verbs on B. Bloom's Taxonomy – *differentiate, compare, predict, assess and comment* (Fig. 5). The frequency of verb repeat is with model 1-1-2-1-1, requiring educators to promote and use, apply and analyze forecasts for the development of energy in the world, for large energy projects, for the impact of high technology on world economic development. In terms of assimilation, the active verbs are relevant to understanding, analyzing, synthesizing and assessing, encompassing groups of conceptual, procedural and meta-cognitive knowledge.

The didactic design and logical presence of the productive construction in the required expected results for the students are explained, because there is a higher degree of complexity of the educational

content, development of intellectual, practical and creative skills, critical thinking, originality and activity of thinking, the self and independent thinking assessing of specific economic problems and situations, commenting on contemporary economic processes and phenomena.

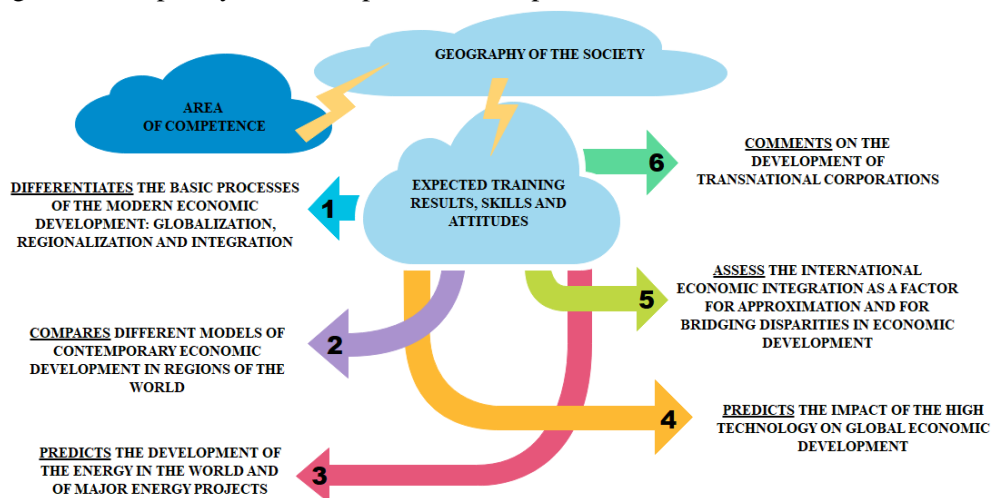


Figure 5. Systematic – summarized macroframe of expected results for knowledge, skills and attitudes in Geography and economics training on module 3

The didactic aspect of contemporary sound and actuality, systematicity and development orientation is the question of trends in world geographic education and, in particular, *regionalization*, as an important step in knowing, understanding and realizing comparisons between regions in the world on the basis of models for contemporary economic development. As a result of international economic integration, students have to assess the differences in economic development and the consequences for individual regions.

Specificity of the DOS for module 3, as well as for the other compulsory modules, is only the fixation of the area of competence and the expected results for knowledge, skills and relations of training in geography and economics. Compared to the DOS for general education preparation, the DOS for profiled preparation lacks correlation, commitment and links to the 9 key competency groups [3, 6].

The training for the acquisition of profiled preparation in all compulsory modules of the profiling school subject *Geography and economics* is carried out according to curricula approved by the Minister of Education and Science. The DOS procedurally sets out the requirements for the curricula for the relevant compulsory module to specify the competencies as expected results of student training at the end of the class [3].

Requirement of the DOS for the curricula for profiled preparation as a structure has a three-module vision that defines the sequence, structure and content of the subject:

- ☞ short presentation of the curricula;
- ☞ school content (topics, competences such as expected training results, new concepts);
- ☞ specific methods and forms for assessing students achievements [3].

The didactic aspect of the training in teacher-related profiled preparation is the freedom to self-plan "didactic work for the practical implementation of the set training results and to achieve the expected results in the relevant curricula for acquiring profiled preparation in accordance with the planned school curricula hours" [3].

The didactic planning and decisions of the teacher depend on his/her professional preparation and personal motivation, and he/she has a significant role to play in the rhythmic assimilation of the school content and "to carry out the relevant learning activities related to the teaching of new teaching material, exercises, negotiation, as well as and to ensure the implementation of the entire curricula" [3].

Each teacher teaches the school content in the profiled preparation according to the requirements of the DOS and the curricula, having the opportunity to make author's interpretations and interpretations in the specific school environment, the type of school, the interests of the students, the professional breadth of cognitive knowledge and skills, as well as the assessment competence in different everyday situations.

The curricula for the XI class of profiled geography and economics preparation in the compulsory module "Modern economic development" has a **meaningful range** - the development of the world economy, overcoming the energy problem and assessing international economic integration. **The training contributes to:**

- ▣ development of geographically and economically key competences of the student and his/her ability to independently argument, discuss, comment and assess different ideas and concepts;
- ▣ expression of critical thinking, use of reference literature and self-development of a scientific thesis;
- ▣ formation of models of behavior for active civic position of the student [7].

The school content in the curricula is composed in **9 topics and 17 sub-topics** (Table 1). The structural-content framework and the sequence of topics follow the requirements and content range of the DOS for the profiled Geography and economics preparation for Module 3.

Table 1. Structural-content and conceptual framework of the training on module 3 in Geography and Economics [7]

№	THEME	SUBTHEME	NUMBER OF NEW CONCEPTS
1.	Modern processes of the economic development	Globalization and regionalization as major processes of the modern economic development	1
		Integration – the main form of organized cooperation	-
2.	Models of the modern economy	Organization of the economic activity in the different models	7
		Market economy – development and future	-
3.	International economic integration	International economic organizations – a factor to overcome the economic disparities	13
4.	Foreign economic relations	Structure of the foreign economic relations	5
		Emerging markets – a major engine of the future economic development	-
		Training teachers – a modern form of the foreign economic relations	2
5.	Dynamic development of the international tourism	International tourism – a modern form of the economic development	-
6.	Current condition and development of the energy	World Energy System – Electricity and Heat	5
		Nuclear energy – a factor in the global geopolitics	-
7.	Major energy projects in the world	Electricity production from renewable sources and prospects for development of energy projects	10
8.	The high technologies and the world economy	Modern applications of the high technologies in the economy development	10
		Territorial distribution of the high technology production in the world	-
		Prospects for the development of the high technologies as a major factor for the modern economic development	-
9.	Transnational corporations	Transnational corporations – a product of the globalization process	6
		Problems and future of TNCs	-
TOTAL	9	17	59

A total of **59 new concepts** from compound and single concepts are included in the curricula. The system of school geographical education has already laid the cognitive conceptual foundations and the system of geographical terminology (grades V to X) as a result of vertical intra-disciplinary integration. The profiled focus of the XI class training students is free to apply the geographical concept system and to

upgrade and extend it. Most new concepts are localized for topics 3, 7 and 8 – a total of 33 new concepts. We identify only one topic where no new concept is introduced – topic 5.

The curricula contain **the recommended percentage distribution of compulsory school hours** in descending order of lessons for new knowledge, for practical activities and discussions for lessons for control and evaluation, for negotiation and summary (Fig. 6). Didactic specificity is the name of the types of lessons that differ in name from those in general compulsory preparation, but are also explained in response to the age characteristics of the students, profiled preparation, in-depth and comprehensive study of the educational content. A peculiarity of the percentage recommended ratio is the conditionality with which they are defined by "up to" the respective percentage ratio - up to 60%, up to 22%, up to 12%, up to 6%.

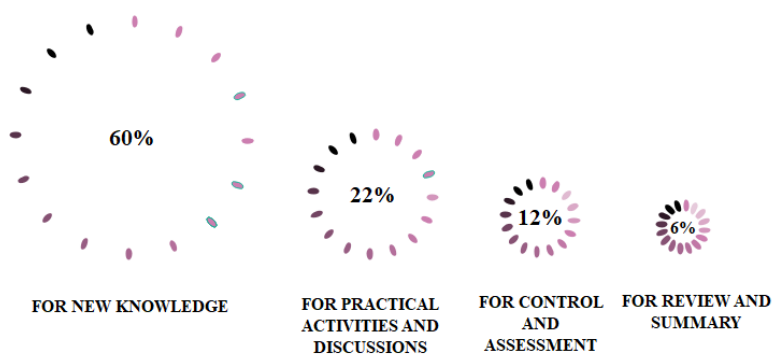


Figure 6. Recommended percentage distribution of compulsory geography and economics school hours in the profiled preparation

The ratio in the formation of the term assessment of students in geography and economics training in profiled preparation is a specific didactic aspect in favor of assessments from control works and to a lesser stage of current assessments from class work, participation in group considerations and discussions, as well as from practical assignments in class. 10% share the estimation of homework and project work (Fig. 7).

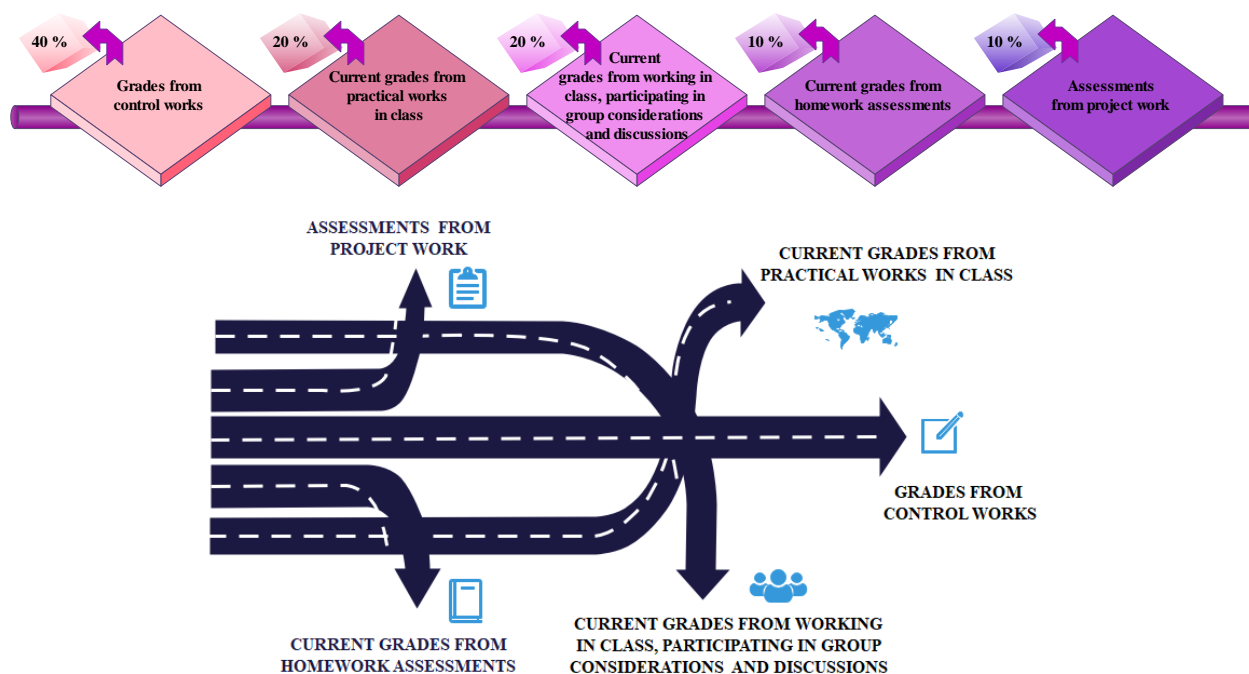


Figure 7. Ratio in the formation of students' term assessment

An innovative and important didactic moment in the curricula, which is normatively enshrined in the curricula, is the possibility for students to be assessed by their homework and projects, which has a cumulative ratio of 20% in the formation of the term assessment. Extremely high is the percentage ratio in the formation of the term assessment, which is assigned to the assessments from control works.

There is no objective methodico-didactic and pedagogical explanation for this large percentage of control work with exaggerated importance for feedback. The only argument for the presence of this large percentage of control work is explained by the choice of the school subject *Geography and economics* as a profiling subject and the presumption of its election by the students of the upcoming state matriculation exams.

An important didactic aspect of the profiled geography and economics preparation in module 3 are the activities that teachers need to direct students' work in the educational process for contemporary economic development in the world:

- interpretation of geographical and economic knowledge for the development of the world economy;
- formation of active citizenship on major economic problems of humanity;
- placing students in specific practical situations;
- involving students in discussions;
- creating conditions for team work;
- creating conditions for the expression of the personal qualities of each student by developing geographical and economic paper-abstracts and projects;
- developing the student's creative pursuits [7].

In the curricula are determined the activities for the acquisition of key competences and cross-curricular links.

The activities are composed of a total of 7 out of 9 key competency groups. The lack of the other two groups of key competences is not justified. The lack of a group of *foreign language skills* de facto and de jure directly serves most of the new concepts. Proof of the necessity of being present in the curriculum of this group is written in a foreign language "*average quotation of the Brent variety*". [7] The expected results include foreign-language regulations for the „Softbank“ Desert Solar Project and sand extraction for the "Kearl" Project.

Another proof is the content of the module, which is entirely relevant to the contemporary economic development of the world, covers topics for which there is not a large amount of information in the information space in Bulgarian, which implies the use of foreign languages. The argument for the direct need to apply foreign language skills is part of the geographical terminology – shale gas, green energy, currencies and foreign exchange earnings, international organizations, duty-free imports, patent trading, regional integration, mega-corporations and more. A significant argument for the presence of the second group of key competences is the cumulative ratio (20%) for assessing students from homework and project work, adding to the relevance and mass of project work in most Bulgarian schools under European programs that are being implemented. in high school education, as well as the implemented training practices under the Erasmus + program in professional education and more projects.

Participation in national and international projects and programs, homework and classroom assignments, mapping of leading countries and high technology and research producing regions, as well as mapping of modern tourist flows and world tourist destinations are directly linked with the application of skills from the other missing group of key competences – 8 *cultural competence and skills for expression through creativity*.

The cross-curricular links are related to a total of 4 groups of key competences (1, 2, 3 and 4 groups) and their relevant school subjects: *Bulgarian language and literature, foreign language, mathematics, history and civilizations, technology and entrepreneurship, information technology*.

The expected training results for knowledge, skills and attitudes have been approved and implemented through active verbs – 47 in all, with active verbs predominant with the productive character of the required results.

The theme of didactic aspects of the training on the compulsory module 3 in geography and economics is the subject of a further and ongoing study, which implies an intra-disciplinary reading of the study and other compulsory modules of the profiled preparation.

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Establishing test tasks for current verification and evaluation of the results of geographic and economic learning – areas of competence "Nature geography" – of 8 classes

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Abstract: *The purpose of this study is to develop a model of test evaluation through various didactic tests, as a tool that takes into account the level of students' acquired knowledge, skills and competences, their psychophysiological and personality characteristics.*

The subject of the model is the content of Geography and Economics in grade 8, the field of competence "Geography of nature". Some didactic aspects and requirements for the development and selection of test tasks and their testing have been interpreted. The research is also experimental and practical in nature, through the developed procedures, rules and criteria for evaluating the type of learning activity by cognitive levels, indicators and assessment indicators.

The following basic characteristics of the test have been observed – validity, reliability, objectivity, relevance and specificity. Test control is consistent with the following basic principles: goal compliance; measuring clearly defined learning outcomes; measuring a representative sample of the curriculum content included in the curriculum; contain such tasks as are most appropriate to measure the relevant learning outcome; serve to improve the outcomes of geography and economics training.

Keywords: *test tasks, geography and economics, evaluation by test tasks*

Introduction

The relevance of the issues of control, assessment and test verification is in the context of the new legislation in Bulgarian education. Control is a type of activity, a process in a technological cycle, related to the analysis of results. The requirements for this activity are justified by individual character, systematic, objective, diverse, comprehensive process.

Assessment of students' learning outcomes, in the form of test written assignments, is of great importance for the application of control in the modern geography and economics teaching process and the related assessment and assessment directly related to it.

The theoretical and methodological analysis of the test evaluation and the theoretical analysis and synthesis of the current methodological literature substantiates the theoretical foundations of the investigated problems.

Materials and methods

The methodology and tools of the study include a theoretical analysis of the literature on the problem; analysis of the educational documentation on the topic, the activity of the teacher and the students; system-structural analysis of the educational content on the topic; testing method to determine students' learning levels of the main elements of the content; pedagogical experiment – ascertaining and educating; statistical methods for processing and presenting the results obtained.

The results of the study are presented in the following ways: tabulated – through frequency tables with charts according to accepted criteria and indicators; by calculating the relative share and correlating the number of students with the corresponding indicators for the individual criteria.

Results and discussion

At present, the use of test questions and variants in checking and evaluating students' results is widespread in practice. The reasons are not yet scientifically and methodologically fully proven. The test is standardized with the introduction of National external evaluation and State Matriculation Exams in Bulgarian Education. Another leading reason is the change in the curriculum and the number of classes in the subjects, and as a leading subject with reduced hours, the general education subject is geography and economics. More and more universities are taking entrance examinations in the form of tests/paper or electronic. Tests such as assessment and measurement procedures are not a new form and traditionally take place and function in training.

According to St. Dermendzhieva, different test and non-test task in teaching geography.

The geography and economics test includes:

- the educational objectives described;
- is part of a test variant through which to test empirical, theoretical and methodological knowledge;
- is a tool for assessing and measuring skills;
- check and evaluate the student's achievement at a certain cognitive level;
- meets the requirements for the course;
- meets testological requirements such as reliability, validity and difficulty;
- scale to measure made;
- is subject to standardization and digitization [2].

According to A. Ivanov, the term geographical test is a systematic set of tasks:

- with geographical content and specific form;
- relevant to this content;
- allowing to effectively measure the level of preparation (knowledge, skills, habits, ideas) by geography.

The specificity of geographical tests is determined by the specificity of the subject of study in geography, the specificity of the content of geography and the studied geographical discipline [6].

In this study, the focus is to develop a model of test evaluation through various didactic tests, as a tool that takes into account the level of students' acquired knowledge, skills and competences, their psychophysiological and personality characteristics. The ability to apply test tasks and questions to diagnose and evaluate students' knowledge and skills, as well as the level of quality of knowledge and skills, and the ability to apply them in solving test tasks.

On this basis, test variants are developed to test, diagnose and analyze students' knowledge, skills and competencies after learning certain lessons. The basic characteristics of the test, the stages of creation of tests and test tasks are observed. Depending on the objectives of the particular study, the approach for analyzing the results is determined.

The objectives of this study are:

1) Analysis of national standards, curricula for general education with regard to the requirements for checking and evaluating the achievements of students in geography and economics.

2) To track and analyze the educational content in geography and economics in 8th grade, the area of competence "Geography of nature" and the attempt for didactic placement of test variants for checking, diagnosis and analysis of the knowledge, skills and competences of the students after studying of certain lesson units.

3) To interpret some didactic aspects of the development and selection of test tasks and their application.

4) Diagnosing the student's individual achievement and progress and identifying his/her learning needs and areas in need of support.

5) Identify the causes and necessary measures to overcome the negative results;

6) Marking opportunities for synchronization and harmonization of types of test tasks applicable in all types of schools in the country.

The **subject of the model** is the content of Geography and Economics in 8th grade, area of competence "Geography of nature".

The **subject of the study** are test variants such as forms of assessment in geography and economics (general education in grade 8 in a targeted, meaningful and procedural plan, which allow to diagnose and evaluate the knowledge and skills of students, as well as the level of quality of knowledge and the skills and ability to apply them in solving test tasks.

Research methodology and tools.

- theoretical analysis of the literature on the problem;
- analysis of the educational documentation on the topic, the activity of the teacher and the students;
- system-structural analysis of the educational content on the topic;
- a testing method to determine students' levels of mastery of the main elements of the content;
- pedagogical experiment - ascertainment and trainer;
- statistical methods for processing and presenting the results obtained.

The results of the study are presented in the following ways:

- Tables - through frequency charts with charts according to accepted criteria and indicators;
- by calculating the relative share and correlating the number of students with the relevant indicators for the different criteria.

The pedagogical experiment as a ascertaining and teaching sub-stage on the topic is realized with students in four classes of 8th grade/8a – humanities with advanced foreign language learning; 8b and 8c – natural sciences without advanced foreign language learning; 8 years – Software and hardware sciences with advanced language learning at Vasil Levski Secondary School in Dulovo, Silistra area.

The main criteria for evaluating the quality of tests and test tasks are: objectivity; reliability; validity; comparability; economy; utility; impartiality; relevance, significance, balance and specificity. Modern characteristics of the tests – fairness, impartiality, decency, morality, non-discrimination through tendency or misuse of test data.

In this study, the main characteristics of the test are considered – validity, reliability, objectivity, relevance and specificity.

1. **Validity** – shows the degree of accuracy with which the test measures what it is supposed to measure. Specifically measured results are compared with a predetermined external criterion, which may be a regulatory requirement, curriculum, study results. Such an external criterion for didactic tests accepts the requirements of the curriculum in the relevant subject. There are three types of validity: substantive, constructive and criterion validity.

2. **Reliability** – the accuracy of the test being created or used. Each measurement is associated with specific errors. Therefore, when creating a test and evaluating its performance, the magnitude of the error with which the test is measured should also be specified. The quantitative expression of the accuracy, reliability of the test is presented by a reliability coefficient, which is a correlation coefficient between the scores of at least two independent experts.

3. **Objectivity** – means the degree of independence of the conduct and the results of their author. A test is completely objective if different researchers arrive at the same results for an individual.

4. **Relevance/Significance** – The extent to which the test is designed to measure precisely the desired learning outcomes and not anything else. The relevance of the test is directly dependent on the goal setting. The better, more precisely and more precisely the learning objectives are defined in the relevant test, the more fully operationalized the test will be, the more relevant it will be [7].

5. **Specificity of the test** – the extent to which such specific knowledge is required to solve the test tasks, which is not possessed by the so-called. "Smart novice", ie a person who has not completed the relevant training course but can decide the test correctly due to his/her general intelligence [7].

The didactic tests are designed to measure students' understanding of some of their knowledge. Most tests created by classroom teachers are didactic. Each didactic test consists of a series of questions and tasks to check the level and degree of fulfillment of the requirements of the curriculum regarding the knowledge and skills of students in a particular field.

The didactic tests are diverse and can be divided into:

- ▶ Depending on the purpose, the tests are for preliminary, ongoing, final control;
- ▶ Depending on the degree of applicability - non-standardized and standardized;
- ▶ In the manner of performance - written, oral, motor;
- ▶ According to the standard - normative and criterion (oriented towards the purpose of the curriculum);
- ▶ In the way of conducting - individual and collective;
- ▶ According to the nature and difficulty of the tasks in the test: reproductive, reflexive and reproductive-reflexive;
- ▶ According to the answer coding method: with a graphic code, with a numeric code, with an alphabetic code;
- ▶ According to answer: structured, unstructured and mixed;
- ▶ According to their design, the tests can be: simple (with the same type of tasks) and complex (combined), traditional and non-traditional;
- ▶ According to its structure - ordinary and test system. Test systems are of two types - test battery and test ladder;
- ▶ In terms of content, tests are about achievement, speed and attitude. Achievement tests diagnose the level of learning, speed tests not only account for proper performance, but also the timing of it, attitude tests reveal the relationship of research to knowledge, own work and success;
- ▶ Adapted and computer-based tests [1];

According to Ruther, tests contain types of questions and tasks, depending on their form, namely:

- Free-writing questions and tasks – open-ended questions and tasks;
- Interpretation questions and tasks;
- Association questions and tasks;
- Semi-open questions and tasks;
- Frequently Asked Questions and Tasks;
- Semi-open association questions and tasks;
- Semi-open supplement tasks;
- Semi-open replacement tasks;
- Semi-open tasks for self-construction;
- Semi-open transformation tasks;
- Open questions and tasks;
- Identification tasks;
- Tasks with alternative answers;
- Tasks with optional answers;
- Tasks with associative choice answers;
- Tasks with associative answers to complement;
- Tasks with optional replacement answers;
- Tasks with optional answers to expand;
- Tasks with optional matching answers;
- Tasks with optional conversion answers;
- Tasks – substitutes [1].

The didactic aspects and requirements for the development and selection of test tasks and their testing are interpreted by leading authors. A good knowledge of the main characteristics of the different types of questions and tasks, their strengths and weaknesses, as well as the basic rules that must be followed in their construction, allows each case to select precisely this type of task in order to maximize the effect of advantages and minimize the impact of disadvantages.

According to St. Dermendzhieva forms the most applicable in geography training four basic forms of geographical tests - closed, open, tasks for establishing correspondences and establishing causality.

1. A closed form of formulating questions in the test. Question: What determines/Who are?
Answer: Circle the correct answer (s);

2. An open form of asking questions. Complete the claim;

3. Compliance. Confirm, confirm or reject claim...;

4. Establishing cause and effect relationships. Complete..., compare..., grade..., sort..., in what order... [2].

A. Ivanov, (2012) develops four main types of test tasks:

1. According to the nature of the assignment itself and the order for execution:

1.1. completing (supplementing) a statement – associative in nature for revealing patterns; association by similarity, contrast, location, cause-effect; test tasks for drawing, image reproduction, image reading; these types of tasks are used in both semi-open and closed test tasks;

1.2. test question answer – used in semi-open tasks; meaningful and functional questions are used; the test questions are in question form;

1.3. answer to a test task – mathematical problems; classification tasks; description tasks; cognitive tasks; tasks for recognizing and analyzing images and images; spatial orientation tasks; test tasks of this type are in mandatory form.

2. According to the form of performance of the test tasks:

2.1. open test tasks – free writing questions and tasks; written answer to a question; questions and tasks for interpretation; association questions and tasks; create standalone text;

2.2. semi-open (semi-closed) test tasks – completion of a statement; a short answer to a question;

2.3. test tasks for completing, replacing and correcting text - replacing words, data, facts, editing text; multiple replenishment; complementing geographical text with more than two words; consistent addition; supplementing by choice; filling in missing data; adjusting and editing geographical text; formulating a geographical title;

2.4. closed test tasks – multiple choice tasks; selecting the correct performance (one, two or more correct answers); choice of wrong execution, wrong answer;

2.5. test assignments with the choice of an alternative answer – on the principle of dichotomy (division into groups of exclusionary parts); marking only correct answers; marking true statements with a plus and false statements with a minus;

2.6. multiple-choice test tasks – tasks with one, two, or more true answers; completing a claim; Answer to a question; test task solution; test tasks with the choice of one correct answer; test tasks with the choice of two correct answers; test tasks with the choice of an unspecified number of correct answers from a variety of possible answers; test tasks with the choice of the right answer from the many possible correct answers;

2.7. test tasks for detecting (establishing) conformity – establishing full compliance; establishing incomplete conformity; arrangement of groups of objects, phenomena and activities in groups; belonging to a group or regrouping;

2.8. test assignments to determine the sequence – type of closed test assignments (with answer choice); to determine the quantitative sequence; to determine spatial consistency (directions of the world, change of natural zones); to determine the time sequence; to determine the procedural sequence / algorithm;

2.9. test tasks for recognizing and analyzing images and working with a geographical map – for recognizing images and images – (photographs, computer images, diagrams, graphs, diagrams).

3. According to the level of learning content:

3.1. Knowledge (knowledge reproduction) – Reproduction of facts (knowledge of geographical features, location of geographical features, place of occurrence of geographical phenomena, location next

to the border, geographical coordinates, establishing the direction, form and direction of extension of geographical objects knowledge of quantitative dimensions, presence or absence of specificity in a geographical object):

3.1.1. knowledge of geographical names – spatial position of objects, connection of names with a certain type of geographical objects, contemporary meaning of geographical names, correspondence of past and present geographical name;

3.1.2. geographical description (feature) – determining the correspondence of a geographical object, territory, phenomenon, process by geographical feature; recognition of an object, phenomenon, process, territory by geographical description; distinguishing by description between several objects; determining the geographical affiliation of both object, phenomenon to a certain group of objects, phenomena, activities;

3.1.3. knowledge of geographical concepts – matching a concept to a definition; tasks to find the correspondence between definition and concept;

3.1.4. knowledge of geographical patterns – a manifestation of geographical patterns: integrity, rhythm, latitude, zonality, altitude, zoning, differences in the natural environment, climate, waters, soils, flora and fauna.

3.2. Understanding and explanation:

3.2.1. understanding geographical knowledge – to transform one type of knowledge into another; to discover the association between individual knowledge; to discover and understand the genesis of geographical objects, phenomena and processes; to understand the peculiarities of the functioning of objects, phenomena, processes and systems; to understand geographical concepts; to understand schematics, charts, tables and graphs;

3.2.2. explanation (interpretation, interpretation) of geographical knowledge – tasks for structural explanation, functional explanation, for causal explanation; test assignments to understand the nature, manifestation and explanation of geographical patterns.

3.3. Use (application) of knowledge and skills:

3.3.1. test calculation tasks – number determination, distance determination, scale setting, height difference determination, amplitude calculation, relative proportion calculation, demographic calculation and demographic characterization;

3.3.2. test classification tasks – ordering facts, phenomena and processes by a specific feature;

3.3.3. grouping test tasks – to establish consistency between two groups of concepts;

3.3.4. test tasks for determining the place among elements or a range of quantitative characteristics;

3.3.5. Geographic Orientation Testing Tasks – Landscape Orientation, Geographic Map Orientation, Geographic Map Orientation;

3.3.6. test tasks for the geographical characterization of certain sites, processes and territories;

3.3.7. test tasks for the use of technological knowledge and skills.

3.4. Cognitive knowledge and skills:

3.4.1. for analysis;

3.4.2. for analysis of geographical text;

3.4.3. for comparison;

3.4.5. for synthesis;

3.4.6. for generalization;

3.4.7. for conclusions and evaluation;

3.4.8. test tasks for discovering the skills of anticipating and predicting the consequences and results [6].

The content of the tests is formed by the test tasks included in them. A test sheet or test book, scroll is prepared. State educational standards, approved curricula, course content, and the approach of the test taker are the main elements on which each test depends. The subject of pedagogical control and assessment are the knowledge, skills, habits and ideas that are formed during the education of the respective educational level, class and course. The test assignment is the main component of the tests. They are forms of recommendation to those tested: a question to be answered or to choose the correct answer; a test task that requires a specific action – calculation, location; continuation of the claim. The

basic requirement for all assignments in the geographical test is the choice of a single correct answer. The test uses the same or different types of assignments. A one-answer geographical test of four possible answers or a one, two or more choice answer geographical test.

The answers to the assignments meet the requirements: to reflect the content of the course; be directly related to it; no factual errors; the answers to the test tasks are related to the previous knowledge; text responses (correct and distractors) in alphabetical order, worldwide, in order of origin. The Scale is used to translate the quantitative results of the measurement of knowledge and skills into qualitative assessments. It is prepared together with the formulation and determination of the set of test assignments. Specific evaluation criteria are drawn up for open-ended test assignments, with each item having a different number of points. For semi-open test assignments for adding a single word, words and expressions, two points are defined, but if one word is added, one point is defined. In closed test items with the choice of correct answer, a scale is applied and the correct answer is evaluated by one point. The higher the number of points is assigned to the compliance tests. For test jobs with graphic images and the use of a map – for recognizing an image, an image, determining a direction, a geographical position, a minimum number of points is determined.

The quality of geographical tests is determined by the evaluation of three main indicators – difficulty of the test; reliability of the test; validity of the test.

The methodological principles in constructing the test assignments include:

- Organizational and methodological requirements;
- What and what part of the content will be tested;
- Choosing the form of questions, continuing the assertion and task;
- Compliance with principles of composition: the principle of contradiction; the principle of the opposite of answers; the principle of uniformity; principle of cumulation; principle of combination; principle of grading; principle of implication; principle of grading the correctness of the answers; the principle of brevity of assignments and answers; the principle of logical determination; the principle of double opposition; the principle of non-negligence [6].

Some suggestions for testing rules:

Rule 1. Use a task format that has only one true or best answer (correct, complete answer).

Rule 2. Look for the shortest possible phrases, avoiding the verbosity and phrases of the textbook.

Rule 3. The problem that the task is focused on must be posed in its condition. Include the basic idea and most of the phrases in the condition.

Rule 4. The tasks must be independent of each other.

Rule 5. Avoid negative phrases and negative judgments in the condition of the task.

Rule 6. The question form when formulating the condition is preferable to the unfinished sentence.

Rule 7. Avoid trivial tasks. (Questions that measure knowledge that are not essential in training are considered here).

Rule 8. When arranging the answers, follow their logical sequence (For example, they can be arranged in chronological order or in alphabetical order. There should be an ascending or descending order when answering the quantity indication.).

Rule 9. The answers must be approximately the same length and homogeneous in nature.

Rule 10. The position of the correct answer must vary on the principle of randomness.

Rule 11. Avoid words or phrases that may play a key role in finding the right answer.

Rule 12. Use attractive distractors (distractor – Latin *distraho*, *distractum* – stretch, stretch) – false, distracting alternative among a group of possible answers; incorrect test answer. The "none of the above" and "all of the above" types should be used with great caution because they are not considered effective distractors.

Rule 13. Use multiple-answer tasks only when other types of tasks are more inappropriate.

Rule 14. The visual layout of a task should facilitate its faster and easier perception.

- By marking using bold font, capital letters, underline, etc.;
- Alternatives use letters, not numbers;
- The list of alternatives is arranged vertically, not horizontally;

- The task is not to "tear" into two pages.

Criterion-reference tests are designed to test how well students are aware of the main goals of the learning segments. Normal reference tests are designed to compare students with each other, to determine the individual level [6].

In today's conditions of quality education, the basics of computer testing are being developed and developed. This allows for more accurate pedagogical measurement, verification, control and assessment at the level of training. The application of ICT diversifies the forms of testing and processes the testing process, allowing for self-assessment at the level of preparedness [6].

This research study also highlights several important directions that result from the theoretical analysis and synthesis of current methodological literature in order to justify the theoretical foundations for preparing, applying a test form to evaluate and analyze student achievement after learning certain units of instruction, specifically through the field of competence "Geography of nature" in 8th grade. Comprehensive analysis presents as a "white" field in the theory and practice of teaching geography and economics the lack of a system of thematic assessment of students.

Practice – application

In education in geography and economics in the first high school class 8th grade – 10th grade in the 2019/2020 school year, the students' supervision and assessment is in accordance with the Law on vocational education; Ordinance No. 5 of November 30, 2015 on General Education Preparation and the State Educational Standard for Assessing the Results of Student Education under Ordinance No. 11 of September 1, 2016, on Evaluation of the Results of Student Education, effective 20.09. 2016.

The control at the high school stage is carried out by traditional methods - oral and written examination.

Both standardized tests of study aids approved by the Ministry of Education and Science and educational sites specialized in the Geographic Portal are applied; Geography Magazine, 21; Geoscience; I'm learning; Bg School; Books for the teacher of geography and economics and more and more often test assignments prepared by geography and economics teachers as their own resources.

There are four main forms of testing in geography and economics education – closed, open, mapping and causation.

Content – analysis of educational content in geography and economics in 8th grade

Education in geography and economics in 8th grade is aimed at acquiring key competences by mastering knowledge, skills and relationships related to the nature of the Earth, its natural resource potential and the sustainable development of the geographical space. The formation of the geographical culture of the students continues.

The curriculum in geography and economics for 8th grade (general education) includes as a content of the course of study: three areas of competence: Planet Earth; Geography of nature; Geographic information that is implemented through two leading topics and twenty-one sub-topics.

Purposeful analysis of the main topics, concepts and categories related to the achievement of key competences by mastering knowledge, skills and relationships related to the nature of the Earth, its natural resource potential and the sustainable development of the geographical space can be achieved through a comprehensive review of the existing syllabuses and DOS for educational content, as well as textbooks and teaching aids approved by the Ministry of Education and Science.

The research study conducted in this report analyzes the textbooks and training kits used in the school education system in the 2018/2019 academic year, according to Appendix No. 1 approved by Order No. RD 09-39/16.01.2018 of the Minister of Education and Science.

The research study conducted in this report analyzes the textbooks and training kits used in the school system during the 2018/2019 school year.

1. Geography and Economics (electronic version).

- 1.1. Popov, A. and the collective, "Anubis" Ltd., 2017.
- 1.2. Rusev, M. and the collective, "Archimedes 2" Ltd., 2017
- 1.3. Penin R., and collective, "Bulvest 2000" Ltd., 2017
- 1.4. Dermendzhieva S., and the collective, "Prosveta-Sofia" AD, 2017.

In the textbook of the publishing house "Anubis" with authors A. Popov and staff the content is covered in 36 thematic units. Planet Earth is covered in three sub-topics. The topic of Geography of

Nature is covered in twenty-nine sub-topics. Lessons are provided for initial and annual negotiations, activities and controls.

In the textbook of the Archimedes Publishing House with authors M. Rusev and the staff the content is covered in 36 thematic units. Planet Earth is covered in four sub-topics. The topic of Geography of Nature is covered in twenty-seven sub-topics. Lessons are provided for initial and annual negotiations, activities and controls.

In the textbook of "Bulvest 2000" publishing house with authors R. Penin and the staff the content is covered in 29 thematic units. Planet Earth is covered in three sub-topics. The topic of Geography of Nature is covered in twenty-four sub-topics. Lessons are provided for initial and annual negotiations, activities and self-checking controls/tests.

In the textbook of the publishing house "Prosveta" with authors S. Dermendzhieva and the staff, the content is covered in 32 thematic units. Planet Earth is covered in two sub-topics. The topic of Geography of Nature is covered in twenty-seven sub-topics. Lessons are provided for initial and annual negotiations, activities.

Organization and methodology of empirical pedagogical research in geography and economics in 8th grade – a model for test evaluation through various didactic tests, as a tool that takes into account the level of students' acquired knowledge, skills and competences.

The main purpose of this development is to develop a test evaluation model through various didactic tests, as a tool that takes into account the level of students' acquired knowledge, skills and competences, their psychophysiological and personality characteristics.

The test evaluation in the model is the content of Geography and Economics in 8th grade, area of competence "Geography of nature".

The didactic situation justifies the test options for checking, diagnosis and analysis of students' knowledge, skills and competences after learning certain units. They serve to diagnose the student's individual achievement and progress, and to identify his or her learning needs and areas in need of support. Different test variants have been developed on this basis. The basic characteristics of the test, the stages of creation of tests and test tasks are observed.

The pedagogical experiment as a ascertaining and teaching sub-stage on the topic is carried out with students in four classes of 8th grade/8a – humanities with advanced foreign language learning; 8b and 8c – natural sciences without advanced foreign language learning; 8 years – Software and hardware sciences with advanced language learning at Vasil Levski Secondary School in Dulovo, Silistra District /in the application/.

In this study didactic tests were selected to seek to cover the goals and objectives set by the curriculum for all students. Control is carried out by the test method. The tools are the tests.

For objective evaluation we used the following criteria and indicators.

First criterion. Inwardness

Indicator on the first criterion: Awareness of the essential links between the studied objects, processes and phenomena – thematic test.

The second criterion. Specificity

Indicator under criterion two: It reveals the specific manifestations of geographical patterns – a thematic test.

The third criterion. Responsiveness and flexibility

Criterion 3 criterion: ability to use regularities in similar situations. Quickly find alternative ways to apply them in new situations.

In the search for the most appropriate method for accomplishing the purpose and tasks of our diagnostic procedure, we came to the opinion that the following methods should be applied:

1. A study of the literature on the problem of didactic and criterion-oriented tests;
2. Testing;

3. Mathematical-statistical analysis and methods for tabular and graphical presentation of results (this method is part of the dissertation, where it will be thoroughly considered).

Of the above methods, diagnostic testing is the main test and the rest are ancillary diagnostic methods. We relied on the test because it limits the subjective factors in the test and assessment of knowledge. In addition to ensuring the objectivity of the information, it unifies the requirements for

students and the conditions under which they work. Provides quick access to necessary information (data). Geographic and economics training goals and objectives serve as a starting point for the preparation of the diagnostic toolkit.

We apply variants of tests for the Earth's geospheres according to the model of the educational content in the textbook of "Prosveta" publishing house with authors S. Dermendzhieva and a collective.

Atmosphere test – thematic control – two options. The number of tasks in both options is 15, including the learned content of seven lesson units for the Atmosphere – composition, construction and processes. The task types are open-ended type 11 tasks for highlighting, supplementing, defining and creating short text and image and closed-ended tasks with four answers given, one of which is true – 4 tasks.

Hydrosphere test – thematic control – three options. The number of tasks in all three options is 15, including the learned content of seven lesson units for the Hydrosphere – composition, construction and processes. The task types are open-type 7 tasks for highlighting, supplementing, defining and creating short text and image and closed-type tasks with four answers given, one of which is correct – 8 tasks.

Test/Written control work Lithosphere, Pedosphere and Biosphere – thematic control – two options. The number of tasks in both options is 10, including the learning content of nine lesson units for the Lithosphere, Pedosphere and Biosphere – composition, construction and processes. Task types are all open-ended tasks for highlighting, supplementing, defining, and creating short text and image work [3, 5].

We evaluated students' tests on the scoring system. For each task in a given test, the maximum number of points for a correctly solved task is indicated.

The scale for the assessment of the test results is compiled on the basis of the number of points and their transformation into an assessment [4].

The diagnostic examination is conducted in the regular Geography and Economics classes of the curriculum within one academic hour. The thematic tests are carried out within one class hour. The greatest difficulty was the shortage of hours of thematic control hours and a test check took place in the hours provided for activities and summaries.

The results of the research work on the diagnostic procedure are the subject of development in the dissertation work on the topic "Structural-content analysis of the test tasks in education in geography and economics in the first high school stage" and is discussed in Chapter IV "Empirical and diagnostic study of geographical tests in the first high school stage /8th - 10th grade/.

Conclusion

The development, selection and application of test questions and questions in geography and economics in the 8th grade for the specific subject matter as the subject of the research study in this report draws the following conclusions:

1. Possibilities for application of test tasks and questions, which allow to diagnose and evaluate students' knowledge and skills through thematic control, as well as the level of quality of knowledge and skills, as well as their ability to apply them when solving test tasks.

2. Theoretical and methodological analysis of test evaluation and theoretical analysis and synthesis of current methodological literature substantiates the need for theoretical and methodological models of the investigated problems.

3. In developing didactic tests, each teacher must respect the basic characteristics of the test – validity, reliability, objectivity, relevance and specificity, in order to successfully apply the tests as a tool for assessing student achievement.

4. If the thematic test control is in accordance with the basic principles: compliance with the objectives; measuring clearly defined learning outcomes; measuring a representative sample of the curriculum content included in the curriculum; contain such tasks as are most appropriate to measure the relevant learning outcome; to serve to improve the results of geography and economics training, then the measured and achieved student outcomes will satisfy all stakeholders – teachers, students and parents.

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Theoretical aspects of the competency approach in geography training

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Abstract: *At the end of the 20th and the beginning of the 21st century the implementation of the competency approach was popularized. The approach is associated with developing the qualities in the students that make them prepared for the constantly changing environment. The study present analyzes of the theoretical aspects of the competency approach and associated with it terms – "competence" and "competency".*

Keywords: *competency approach, competence, competency*

Introduction

The modern global world is characterized by dynamics and changes in various areas of human daily life. They inevitably affect the educational system. For this reason, modern education faces a number of challenges related to the implementation of particular types of competences by the students. For the accomplishment of the leading priorities of European Union education policies is applied the competency approach. The formation of specific competences is based on this approach. Competences and the competency approach are one of the most discussed aspects of the educational policies not only in Europe, but worldwide. The topicality of the issues they are examining is defined as an important guideline for realizing a motivated modern educational process for all participants in it. This is reflected in the national program for the development of the education in Bulgaria, which aims to form individuals with critical thinking, accurate self-assessment and adaptability to the changes in the environment, skills for analysis and application of the knowledge for personality development.

Materials and methods

The purpose of this study is to attempt to highlight the theoretical aspects of the competency approach in education with a view to its application in geography and economics education. In order to identify the trends with regards to the competency approach in geography and economics's education and

training, an analysis is performed of the relevant pedagogical, psychological and methodological literature as well as a comparative analysis.

Results and discussion

In order to clarify the theoretical assumptions related to the competency approach, an analysis of the basic concepts is needed.

Competency approach

The concept "competency approach" was originally developed in the psychological literature, where it expresses the ability of individuals to cope with the expectations of the environment in which they exist and pursue their activity. In the context of the above, a competent person has at least 3 components that are limited to the suitable qualities, legal qualifications and the right to belong to a specific professional field [6].

There are different perspectives about the emergence of the competency approach. It is thought that the Competency-based education (CBE) is formed in the US in the 1970s for the needs of professional education [7]. One of the perspectives for its emergence is the need to resolve the discrepancy between the requirements of the society and the labor market and the preparation of graduating students [17].

Another thesis links it with the Bologna Process and the TUNING project. The main purpose of the Bologna Process and the TUNING project is to harmonize the educational structures of the participating countries [1, 9].

The Bologna Process is an initiative that emerged in the 1990s. The main idea of the initiative is the comparability of higher education policies in Europe. The Bologna process aims to create a pan-European higher education area. In order to ensure that all the goals of the Bologna Process are achieved, it is necessary to have:

- easily comparable educational levels in education;
- a unified system of study credits as a unit of student employment;
- and the mobility of students and teachers in the pan-European area.

Tuning Educational Structures in Europe is a university driven project which aims to offer higher education institutions and subject areas a concrete approach to implementing the Bologna Process. The Tuning approach, explained in more detail in the accompanying booklet, consists of a methodology to design, develop, implement and evaluate study programmes for each of the three Bologna cycles. It has been tested in several continents and found fruitful and can be considered valid worldwide. Furthermore, Tuning serves as a platform for developing reference points at subject area level. The reference points are expressed in terms of intended learning outcomes and competences. Learning outcomes are statements of what a learner is expected to know, understand and be able to demonstrate after completion of a learning experience. According to Tuning learning outcomes are expressed in terms of the level of competence to be obtained by the learner. To make levels of learning comparable the subject area groups/Thematic Networks have developed cycle (level) descriptors, which are also expressed in terms of competences. According to Tuning, the introduction of a three-cycle system has brought about a change from a staff centred approach to a student-oriented approach [26].

Tuning has identified approaches and best practices to form specific generic and subject specific competences. Finally, Tuning has drawn attention to the role of quality in the process of designing or re-designing, developing and implementing study programmes. It has developed an approach for quality enhancement, which involves all elements of the learning chain. It has also developed a number of tools and has identified examples of good practice, which can help institutions to boost the quality of their study programmes [26].

In the evolutionary development of the competency approach, four main stages can be distinguished:

- The first stage – from 1960 to 1970. During this stage competency approach is widely applicable mainly in the theory of language, language training and foreign language training.
- Second stage – from 1970 to 1990. During this stage the competency approach is used not only in language training but also in other fields such as pedagogical theory and practice for the development of testology and standardization.
- Stage Three – 1990 to 2000. During this stage the meaning of term "competence" continues to

evolve and to differentiate into different types by expanding its scope, but often without differentiating itself from the concept of "competency" [21].

Gradually through this stage, in the scientific community and in the international community, the competency approach is asserted as an inseparable part of a new educational paradigm, together with the terms "competence/competency". They also find application in economics, politics and culture in the developed western countries, while in Russia and in other Eastern European countries attempts are being made to differentiate them and also to combine the competency approach with other approaches [18].

- The fourth stage – from 2000 – to the present. During this phase, the framework of the competency approach is clearly outlined. The educational policies in more and more countries are being linked to the implementation of the competency approach. Research and discussions on the identification and evaluation of the key competences and other technological aspects of the competency education, are still ongoing.

In the European Union strategic documents the educational issues are still a topic of interest and are widely considered, namely they consider the requirement to adopt a lifelong learning approach and education and training systems that are more adaptable to the necessary changes and are more open to the world [2]. This requires the development of national qualifications frameworks which are based on relevant learning outcomes and their linking to the European Qualifications Framework. One way of fulfillment of these requirements is by applying the competency approach. Its actuality is dictated by the need for practical implementation of theoretical knowledge and its transformation into activity characteristics [22].

Ultimately, we take as an expected result from the implementation of the competency approach to be the formed ability of graduating pupils/students to act adequately in different problem situations, to be able to activate their own potential for accurate assessment of the situation and to take successful steps to solve the emerged problems.

The expectations mention above have been formulated on the basis of differing views on the nature, importance and ways of applying the competency approach in education.

They point out that the competency approach is a set of general principles defining the objectives of education, the selection of educational content of education, the organization of the educational process and the evaluation of educational results [6]. In this way it influences the main units of the learning process and it emphasizes on the result of the education. However this is not considered as learned information in terms of volume, but as a person's ability to act in different situations.

At the same time, the competency approach is considered as a way of improving the educational system, aiming to assimilate the achievements of the world culture, to form professional knowledge, skills, habits, creative abilities and modes of activity, and the ability for personal and professional development throughout the year [16].

Its application shifts the focus of the activity, which is transferred from the teaching activity of the teacher, to the learning activity based on the initiative and responsibility of the learners. In this way, training is realized that develops the ability to act effectively beyond the limits of learning situations and problems. The outcome of the education becomes significant after graduation because it results from acquired life-oriented problem-solving set of skills and a developed readiness for productive independent and responsible activity [10].

Competencies and competency

The basic terms in the methodology of the competency approach are "competence" and "competencies". In Western literature, these two terms are in most cases used as synonyms, and in Russian literature they are distinguished [11, 12, 15, 25]. There are various interpretations in the Bulgarian scientific literature which following the implementation of the European and international standards in the educational field in our country, are increasingly consolidated around the terms defined in the official documents [7].

The concepts of "competence" and "competency" have been substantially evolved since their inception. The term "competency" is believed to have been applied initially by N. Chomsky in connection with his linguistic studies [4]. The term "competence" gained popularity on a later stage. Initially, the term „competence“ is associated with human resources management, staff appraisal and the professional education in an industrial management context, as well as improving the effectiveness of professional

performance [3, 8].

The competence describes personal qualities, associated with effective performance and high motivation and represents the interaction of the individual with the environment in order to acquire certain abilities, whereby the self-competence and achievements, influence the subsequent performance through the expected results, associated with certain attitudes and their interpretation [23]. Later, tests were developed for prediction and measurement of the competence as a form of intelligence for a consulting firm. Described this way, the competence encompasses skills and attitudes beyond cognitive abilities such as self-awareness, self-regulation, and social skills; while some of them can also be found in the taxonomy of the individual, the competencies are generally of behavioral nature and could be learned [14, 24].

Later, the application of the competency approach in some aspects of training and development of human resources and language training is expanded [13]. This model of linguistic competence is influenced by similar models of numerical competence, spatial competence and other fields from scientific knowledge [4].

The competence can be understood as a combination of the following elements: knowledge (theoretical and practical), habits (intellectual and practical) and attitudes (value orientations and attitudes) [21].

By using the competency approach the goals of education and the model of achievement of the results are being changed. It is related to mastering the knowledge necessary for the trainees to achieve the predefined goals [19, 20].

Competences represent a dynamic combination of cognitive and meta-cognitive skills, knowledge and understanding, interpersonal, intellectual and practical skills, and ethical values. Fostering these competences is the object of all educational programmes which build on the patrimony of knowledge and understanding developed over a period of many centuries. Competences are developed in all course units and assessed at different stages of a programme. Some competences are generic (common to any degree course); others are subject-area related (specific to a field of study). It is normally the case that competence development proceeds in an integrated and cyclical manner throughout a programme [26].

In the writings of many psychologists, the competence is represented by three main types (Figure.1). Conceptual competence is based on rules, abstract knowledge of the entire subject area. Procedural competence is related to the procedures and skills needed to apply conceptual competence in specific situations. Implementation competencies are needed to evaluate a problem and select the right strategy to solve it [13].

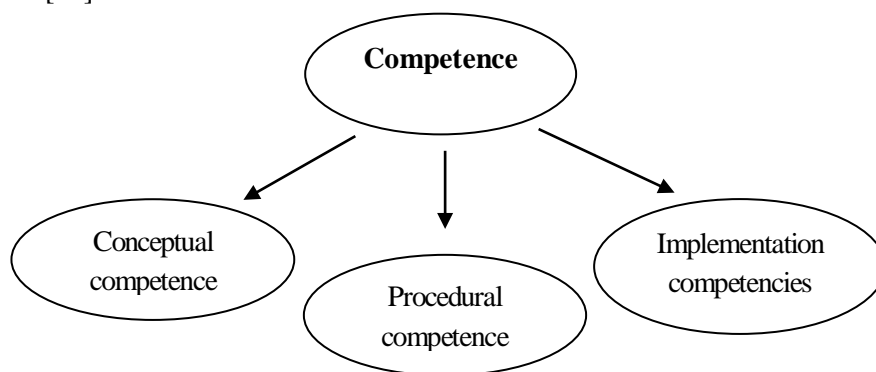


Figure 1. Main types of competencies

Examining the competence and competencies, it is established that competencies are actions resulting from a certain practical manifestation based on open knowledge, skills, experience and legal powers in a certain field, and competence is broader term – with larger scope of its content. Competence is a personal quality, peculiarity and characteristic of an individual as a result from the action and the activity.

Geographical Competence

The application and use of the competency approach in geography and economics education is linked to the formation of geographical competence in the pupils. It is perceived as a triad of process-object knowledge, motion skills and assessment habits for orientating in the surrounding reality at local,

regional and global levels. Lack of meaningful adequacy of each one of these components would lead to deformations and lack of quality geographical education [5].

In the competence orientation of the educational process in geography and economics, the emphasis is directed on the realization of goals related to the motivation, self-determination, socialization and development of the students' individuality. Thus, the main goal of the geographic education is to prepare competent specialists with constructive knowledge of different aspects of life, with habits for creative work with intellectual and professional toolkit, with abilities for social and interpersonal interaction. Goals are defined as outcomes at the end the geographical education and underlie the conceptual change from a content-based approach to a competency approach at the end of education [22].

In the educational process of geography and economics, competence is applied to account the end result of a particular training in the form of geographical competence, mathematical competence, etc. Hence, competence requires students to master the acquired knowledge, skills, competences and values and their use in solving emerging problems in the content area of geographical education.

Conclusions

Based on the above we can summarize:

- The competency approach is one of the modern educational approaches that has important meaning for geography and economics training.
- The competency approach leads to the achievement of the educational outcomes embedded in the curricula. Through its implementation, students' competences are formed and developed, which guarantee the effectiveness of the training.
- Competencies reflect action in a particular practical manifestation, which are based on knowledge, skills, experience and legal authority in a particular field. Competence is broader in scope and broader in content term than competencies. It is the personal quality, peculiarity and characteristic of the individual, which is the result of its activity.
- The expected result of applying the competency approach in geography and economics training is the formation of the ability in learners to act adequately in different problem situations, to activate their own potential for accurate assessment of the situation and to take successful steps to solve the problems that have arisen.
- The application of the competency approach in geography and economics education is expected to contribute to enhancing students' competence, developing their thinking, stimulating the acquisition of critical thinking, creativity and mastery skills, leading to students' personal development.

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Opportunities for forming geographic values for environmental protection

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Abstract: *The ecological problem is one of the global problems of humanity. In the beginning of XXI century the consumption of natural resources exceeded the critical levels of the natural abilities for reproduction of the Earth's natural system. The recent situation calls for a new environmental policy and a new environmental culture to take shape in the younger generation. They should be carriers of another type of thinking, attitude and behavior of the person in the environment in which and from which he lives. One of the ways to do this is to create geographic values for environmental protection. This study presents opportunities for their formation in geography and economics education among upper secondary graduates.*

Keywords: *geographic values, value system, environmental education*

Introduction

At the present stage of the development of society, humanity should realize that the salvation of the world and its transformation into a normal living environment is in the human hands. It is necessary to understand that all activities, both material and immaterial, must be combined with a responsibility to our environment and its rational use and protection.

In the historical development and culture of all people, the connection between man and nature is deeply rooted in the habitat, life and economic activity. For millennia, humankind has uncontrollably exploited the natural resources without thinking about the consequences. It was not until the early 1960s that the problem of the extent of the destruction of the natural environment became aware and debated. The problem has deepened over time and at the beginning of the XXI century the consumption of natural resources exceeded the critical levels of the natural abilities for reproduction of the Earth's natural system.

It is of utmost importance to pay close attention to the increasing consumption of natural resources, climate change, the effects of earthquakes, floods, oil spills and environmental pollution. All of them

confirm the thesis that **the environmental problem** is one of the most important global problems of humanity because it affects other problems – raw materials, energy, food, demographics and others.

At the beginning of the XXI century, the environmental problem had its global dimension, but it was also projected regionally. At the regional and local level, risk thresholds take on different dimensions, and increasing territorial differences and contrasts in nature-society interactions are emerging as a particularly important specificity. The current situation requires a new environmental policy and a new ecological culture, which are carriers of another type of thinking, attitude and behavior of the person in the environment in which and from which he lives.

The successful implementation of an environmental policy requires both competent management decisions, commitment and activity from all citizens at all levels. In the context of integrating environmental policy and facing the inevitable prospect of major changes in the living environment, the ecological culture of the population is of particular importance. The issues of environmental awareness and behavior, of reconciliation of awareness and concern, of the factors that determine the transition between concern and pro – environmental behavior are of particular importance for the Bulgarian education as well.

Materials and methods

The purpose of the present study is to attempt to present opportunities for the formation of geographic values for environmental protection in education in geography and economics in the upper secondary education. To achieve this goal, an analysis of pedagogical and methodological literature is conducted to highlight the geographic values as part of the students' value system.

Results and discussion

Nature and meaning of values

In general, values reflect a person's attitude towards the world around him, represented by nature, society and objects of knowledge and their comprehension as meaningful to him or to a particular social group. A person's values determine both the goals he sets and the way to achieve them. They are at the heart of his life course in terms of thinking, relationships with people and his behavior [1].

The process of evaluation and the selection of different values is realized through the expression of value orientations, and the application and creation of values is connected with the value relations. The concepts considered are part of the value development, which contains the meaning of human existence. The most closely applied in the learning process are the values and values that arise to them. They are reflected in the educational documentation and can serve as a basis for implementation in the educational process of geography and economics [10].

Geographic values

The values in geographic education can be divided into three groups: universal, national and geographic. Human values are present in almost all axiological models, and national and geographic values have not yet been sufficiently studied [9].

This is one of the leading motives for exploring the types of geographic values and proposing options for their application in geography and economics education in the upper secondary education. We attribute environmental values to the geographic values.

Geographic values for environmental protection

Geographic education opportunities for value formation are great, but at this stage they are relatively incomplete. Building new values, and specifically environmental values, can be a priority for geographic education [3].

Environmental protection should be part of every student's value system. Faced with the challenges of today, the Bulgarian school today must lay the foundations for both the national consciousness of adolescents, but also for them to form a desire for continuing environmental education, as well as to build a position on global problems of humanity.

The subject of Geography and Economics provides very good opportunities for students to form values related to environmental protection. The main objective of geography and economics education in the assimilation of the content of the course in natural geography in the eighth grade is to acquire key competences by mastering knowledge, skills and relationships related to the nature of the Earth, its natural resource potential and the sustainable development of the geographic space [4].

Geographic values for environmental protection in this training course can be formed through several units in the section **Geography of nature:**

- Atmosphere – composition and construction;
- Evaporation, humidity and precipitation;
- Climatic factors. Climatic zones and areas;
- Hydrosphere. World Ocean. Properties of the ocean and sea water;
- Water on land. Groundwater. Lakes and swamps. Glaciers;
- Rivers;
- Pedosphere. Biosphere;
- Earth's natural resource potential;
- Global problems of modernity.

One of the variants of thematically linking the process of formation of geographic values for environmental protection to the global problems of modernity and sustainable development is by applying a case study on the theme: "Human impact on the world ocean" (Application 1). The methodological requirements for the implementation of the case study include activities combined in the following stages:

1. Preparatory – preparation of a case study and developing materials for its application; (Application 1);
2. Organizational – formulating the case (Appendix 1), motivating the relevance of the topic and indicating the necessary activities and time for solving the case (5 min);
3. Executive – time for the task (3-4 min);
4. Control – reporting and analysis of results, formulation of conclusions (5-7min).

The variants of the students' answers received are related to the following main statements:

- All geospheres are interconnected and if we do damage to one of them, we damage the other as well.

- The lack of rivers and lakes will make it difficult to irrigate cultivable land and feed the animals.

- A sharp decrease in the water level will cause drought in the area and a decrease in the precipitations, which will affect agriculture and people's lives.

- The climate of the Earth may not change dramatically, but there will certainly be problems. As the amount of water decreases, the amount of water evaporation will also decrease, respectively the humidity and hence the temperature.

- Reducing water will also affect people's lives. There will be less water for irrigation, less water for the animals.

- By reducing the water level in the Aral Sea, which is part of the hydrosphere, we are affecting other areas. This will cause the area to dry up and eventually become a desert.

- In the distribution of solar energy in the area, if there is no water source to absorb it, the Earth will warm up excessively, which will lead to desertification.

- The ecosystem that depends on the water basin is being destroyed. Thus, in addition to the economic problem - the lack of water source and its potential loss, there is also an environmental problem – the disappearance of various plant and animal species dependent on the Aral Sea.

-The man, through his activity, contributes to the irreversible decrease of water levels in the Aral Sea. In this way, we threaten not only the life of the aquatic inhabitants but also the integrity of the regional climate.

- This will lead to climate change, animals will have to adapt to new changes, and those who fail to adapt will die.

This leads to the conclusion that 65% of the students have an understanding of the effects of climate change, and the remaining 35% of the experimenters believe that there will be no reflection of the problem; 40% of the students are aware that this will affect the life of the person, and the remaining 60% think that there will be no consequences.

At the fourth control stage of the experiment, the students, with the help of the teacher, formulated the following conclusions:

1. Due to the drying up of the Aral Sea, the climate in the region shows continental features (dry and hot summers, cold and prolonged winters).

2. Dust storms form in the dry parts of the sea, which also affect nearby regions. These storms pollute large areas of the Aral Depression with sea salt, sand, chemicals and more.
3. Salt and sand storms cause acute and chronic diseases among the local population.
4. High infant mortality is observed due to adverse environmental conditions.
5. A sharp decrease in freshwater flow to the sea leads to an increase in its salinity and, as a result, plant and animal species disappear due to the fact that they are adapted to a lower salinity environment.
6. This results in closure of the fishing industry and closure of ports. This industry is no longer of economic importance. Unemployment in the region is increasing.

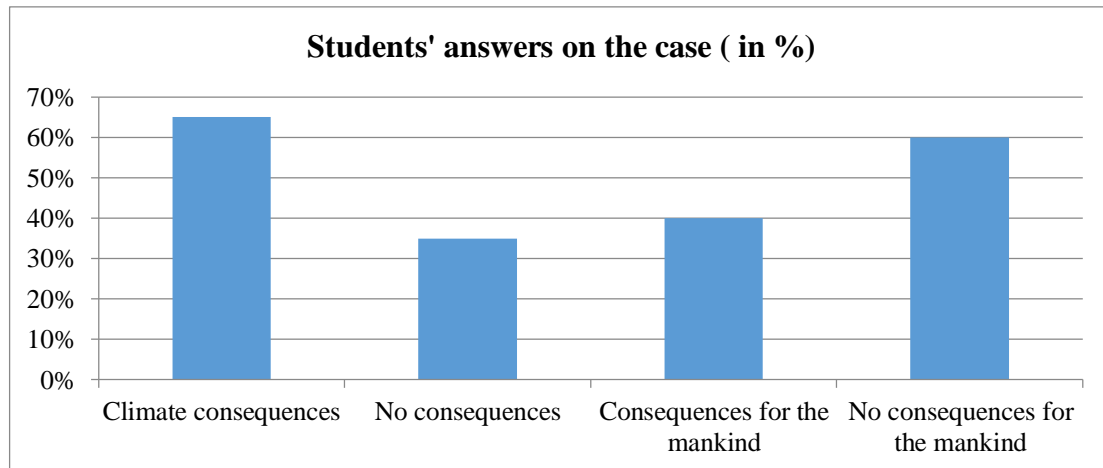


Figure 1. Students' answers on the case

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The process of awareness and acceptance of geographic values related to environmental protection is closely linked to the personality of the adolescent, the level of knowledge, awareness and, last but not least, the interest in global and regional issues. The nature and content of contemporary activities in which young people (both educational and extracurricular) participate, influence their attitude to the ongoing processes in our society [7].

Opportunities for the formation of geographic values for environmental protection can also be found in the acquisition of **ninth-grade** geography and economics content. It aims at acquiring key competences by mastering the knowledge, skills and attitudes related to the political and socio-economic organization of society, regions of the world and countries within them [5]. Students need to acquire skills for predicting the results of human impacts on nature, as well as to understand the need for environmental protection and to develop the following values:

- ✓ Interest towards the geographic knowledge;

- ✓ Commenting on the problems and current trends in the development of the agriculture;
- ✓ To analyze the unique in the natural, demographic and economic appearance of countries, typical representatives of regions in the world.

Ninth-grade education in geography and economics contributes to the promotion of leading values such as religious and ethnic tolerance, environmentally friendly lifestyles, the need for active socialization [2]. In this grade, geographic values for environmental protection could be formed through the following themes:

Section "Geography of the society":

- Settlements and urbanization;
- Primary sector. Agriculture;
- Energetics;
- Metallurgy, mechanical engineering and chemical industry;
- Tertiary sector. Transportation;
- Challenges of the global and regional governance;

Section "Geography of continents and countries"

- Russia;
- China and India;
- South American region. Brazil;
- African region (RSA).

Although the whole course of study in geography and economics in 9th grade provides an excellent opportunity for the formation of geographic values for environmental protection, we have not yet conducted an experiment in this training course.

Geography and economics education in **tenth grade** aims to acquire key competences by mastering knowledge, skills and relationships related to territory, most closely related to the life of the student - the native country [6].

In the 10th class of geographic values for environmental protection the subject of geography and economics can be formed through the whole course of study and especially in the following topics:

Section "The natural environment of Bulgaria. Natural components":

- Terrain;
- Mineral resources;
- Climate;
- Waters;
- Soils;
- Plant and animal kingdoms.

Section "The natural environment of Bulgaria. Natural areas";

Section "Agriculture";

Section "Regional geography. Planning areas".

After studying the section: "The natural environment of Bulgaria. Natural areas", the students presented projects on the theme: "*The beautiful nature of Bulgaria – conservation and preservation.*". The implementation of the method passed through the following stages:

1. Organizational – defining the topic and sources of information (educational and scientific literature, internet sources);
2. Analytical – gathering and processing the necessary project information;
3. Practical – realization of the project;
4. Presentation – presentation and protection of projects, evaluation and self-assessment of the results [8].

The time for the implementation of the projects was six weeks, and for their presentation the students used different forms – presentations, models, posters, brochures and more. Of particular interest was the work of two of the students who had created and printed a book on the subject: "*The palace and the botanical garden in Balchik*" (Figure 2).



Photo 1

Photo 2

Figure 2. Book "The palace and the botanical garden in Balchik"

Models were made on the theme: "The Seven Rila Lakes", "Sinite Kamani Nature Park", "Yumrukskala – protected area", "Kamchia Reserve" and others. The students showed creativity with regard to the materials for production – paper, clay, plasticine, plastic bags, welters, natural materials and more.

The presentation of the projects was also attended by a presentation topic: Central Balkan National Park, Pirin National Park, Rusenski Lom Nature Park, Srebarna Reserve, etc., the photo material being from personal visits of the students.

The period for preparation, development and presentation of projects aimed at shaping geographic values for environmental protection in the tenth grade was filled with creative energy and motivation to work. This has also led to an increase in the achievement rate among the students.

Conclusions

-The geographic values for environmental protection are an important element of the value system of students in high school.

- Their formation and realization through the expression of value orientations in the process of teaching geography and economics are the essence of the students' value development.

- The geographic values are a building block in the value system in the geographic education along with the universal and national values.

- The need for the formation and promotion of geographic values through geography and economics training prepares students for active participation in contemporary civil society.

- The formation of geographic values for environmental protection through education in geography and economics provides opportunities for adolescents to build and defend their own position, to express their views freely on environmental issues, to improve their ability to discover causality and to stimulating students' internal readiness for expression of value orientations.

Application 1

Case study to proof the human impact on the World Ocean and for the promotion of basic geographic values related to environmental protection – VIII grade:

"Human Impact on the World Ocean " (students are provided with images of the territorial reach of the Aral Sea in 1977, 1989 and 2006, as well as a NASA photo)

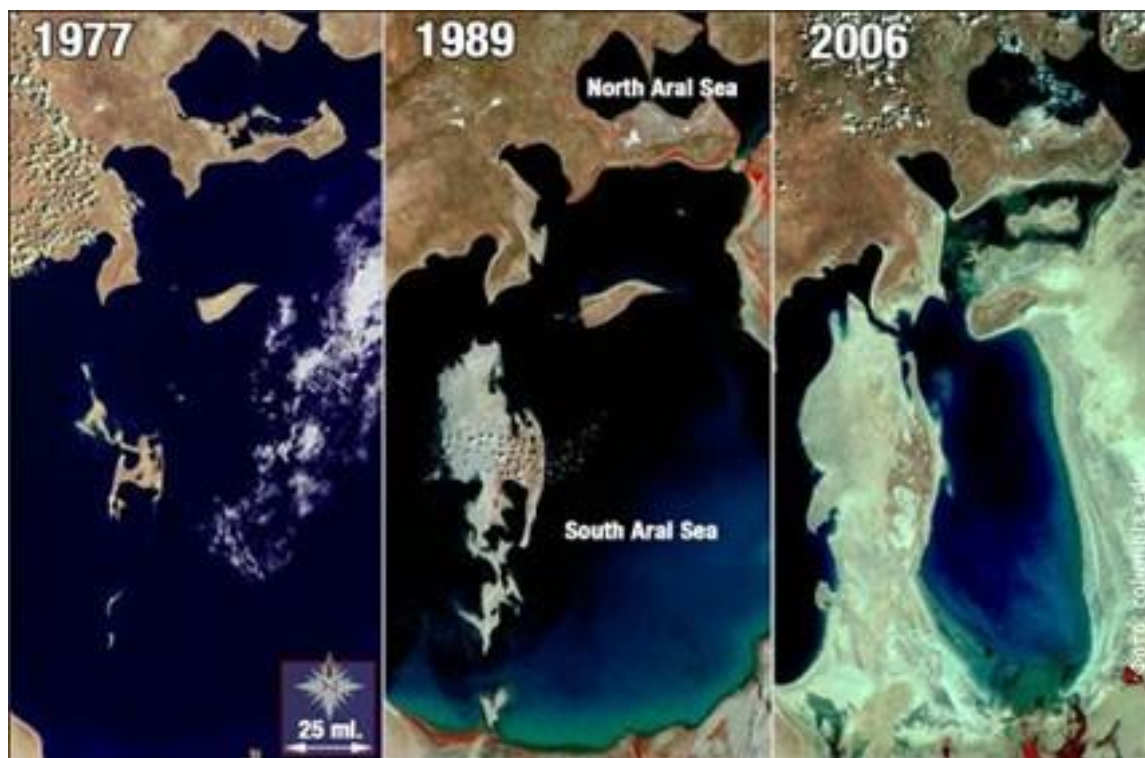


Figure 3. Photos from NASA show the lake's eastern basin is completely dry



Figure 4. Photos from NASA show the lake's eastern basin is completely dry.

Once upon a time there was a sea called the Aral Sea. *The Aral Sea still exists, but has lost more than half its area 30 years ago, and water levels have decreased by about 75%. Its name translates to "sea of islands" since it once had over 1500 islands per hectare. It is a large endorheic basin in Central Asia and is located between Kazakhstan in the north and Uzbekistan in the south. The waters from the melting of glaciers flow to the large Aral depression, and the lake formed until a few years ago was the fourth largest in the world. The Aral Sea has been shrinking since the mid – twentieth century, as the rivers that flow into it, mostly Amu Darya and Sir Darya, have been diverted for irrigation purposes. Historically, significant fluctuations in the Aral Sea level have been observed. Evidence of this is the finding of tree remnants growing on the bottom of the sea. Since the beginning of systematic observations on the Aral sea level, no fluctuations have been observed in the 19th century. In the 1930s, the Soviet authorities began large-scale construction of irrigation canals and, through planned economies, regardless of unrealistic goals, required the mass cultivation of cotton in this region, which is too dry for such activity. With the calls to "transform nature!", Without taking into account the consequences of disturbance of the ecological balance, a livelihood – cottonproduction, which is connected with the today fate of the population in Kazakhstan and Uzbekistan. This livelihood continued to develop intensively in*

the 1960s. By 1990, the area of irrigated agricultural land in Central Asia had increased from 4.5 million to 7 million ha. Water requirements for agriculture in the region are increasing from 60 to 120 km³ per year, which is why 90% of the water flow is diverted for irrigation. Today, the amount of water supplying the water basin has decreased to 5 km³ a year. Thus, from 1961, sea level began to decline at an increasing rate of 20 to 80-90 cm/year.

What consequences will this have:

- For the climate on Earth?
- For the life of the mankind?

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Using PlanetARy at the Astronomical Observatory - Methodological Opportunities

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Abstract: *The article offers an example of using a free product for augmented reality of planetary during outdoor activities in observatories or in classrooms. This approach has been tested among visitors to the Shumen Astronomical Observatory. The idea aroused great interest among visitors of different ages.*

Keywords: *augmented reality, astronomy, training, outdoor activities*

Introduction

Recently, the idea of outdoor activities in school has been popularized. There are many possibilities to conduct a lesson outside the classroom and there are proper conditions on the Shumen plateau that allow such trainings. The astronomical observatory is a powerful tool in this direction. The observatory can enrich the activities planned outdoor lesson. Students, being among nature, have the opportunity to visit the observatory and combine other outdoor tasks with real astronomical observation. Unfortunately, this is not always possible, due to meteorological conditions, problems with the organization of lessons at a later time, the age-related characteristics of schoolchildren, etc.

Education outside school is a very broad term encompassing a range of activities, some of which more obviously support the objectives of formal classroom teaching and learning than others. In this article we want to show an opportunity that can be used successfully for outdoor activities, as well as in the classroom. The idea is based on the option of using augmented reality as part of a visit to the astronomical observatory.

Discussion

According to *Strategy for the effective implementation of information and communication technologies in the education and science of the Republic of Bulgaria* "The main objective of the Strategy is to provide equal and flexible access to education and scientific information at any time and at any place

– in front of a desktop computer, laptop, tablet, mobile phone. For the first time, a unified information environment has been created to serve school education, higher education and science. New technologies in teaching will make the lessons more interesting and attractive, will motivate students and teachers" [2].

In the framework of the scientific program "Information and communication technologies for unified digital market in science, education and security" [3], in which Shumen University also participates, one of the main goals is the introduction of digital technologies in the preparation of special target groups.

The development of information technology has led to the creation of many products in all areas of life including education. There are many advantages that the educational products provide, however for the full development of schoolchildren's thinking, it is essential that training does not depend entirely on technology. Their capabilities should mainly be used to motivate, increase interest, search and process information. The creative and research abilities of schoolchildren should be developed using both modern information, classical methods and teaching aids.

There are two astronomical observatories at Shumen University – one on the campus, and the other on the Shumen Plateau (Figure 1) [4].

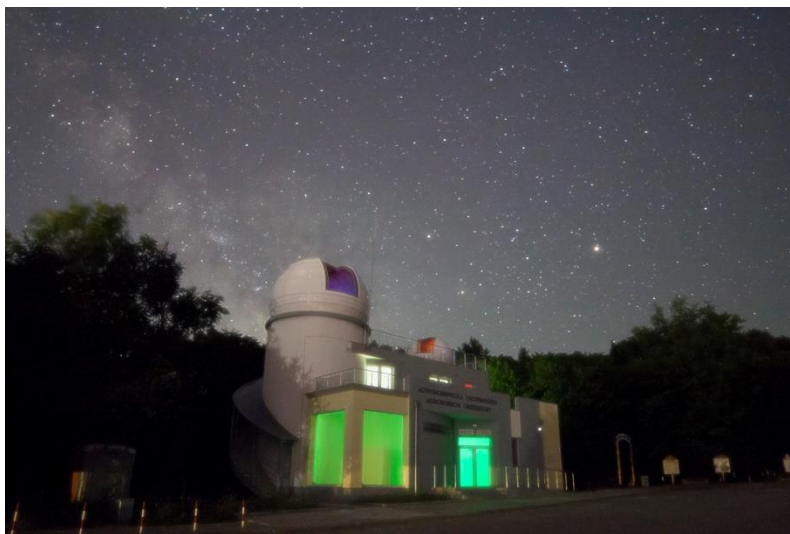


Figure 1. Shumen Astronomical Observatory

They conduct practical classes with university students as well as with groups of schoolchildren on certain days and if desired by the group leader. As it was mentioned earlier, due to meteorological conditions, it is not always possible to conduct real observations. For these cases, Shumen University astronomers have a set of popular presentations, scientific exposition, etc. In addition, the possibilities of augmented reality can also interest schoolchildren and students and add positive emotions when conducting observations.

For example, the planetARy app, developed in 2017 by scientists from the Houston Planetary Institute, can be downloaded free of charge to a smartphone. Background images that are used to create additional reality are obtained at NASA. For visualization, you need posters, a set of which is available on the official website of the institute – <https://www.lpi.usra.edu> [3].

For users, the following instructions are given:

How to use the augmented reality planetARy?

1. You will need the planetARy app, which you can download for free on your smartphone.
2. Select the button **LAUNCH AR** and point your smartphone to one of the planetARy posters.
3. You can enjoy 3D models, realistic images and lots of interesting information created by NASA / UCLA / LPI.




Figure 2. Instructions



Figure 3. Students using planetARy

During visualization (Figure 3), students will see on their smartphones, images of the type of examples shown in Figure 4.

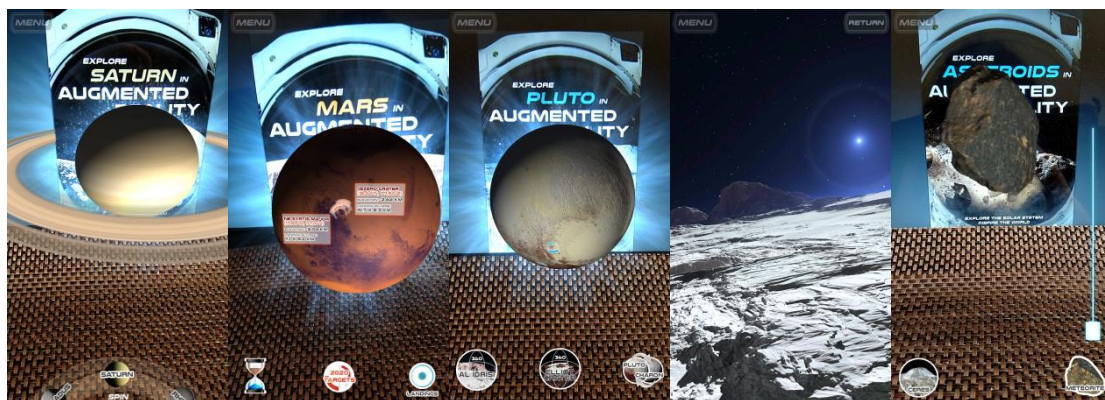


Figure 4. Screenshots from planetARy application

The algorithm of work is as follows – the posters are printed and positioned in a suitable place – in our case, in the hall for expositions of the astronomical observatory. Students in advance or during a visit download the application on their phones and view images and information using planetARy.

Using this product, you can easily make connections with different academic subjects. For example, to make connection with mathematics, an astronomical guide or the teacher gives additional information to schoolchildren (the size of a planet from its satellites, remoteness from the earth, comments on the scale, comments on the ratio of the sizes of a particular planet and the earth, etc.) All information has a close relationship with mathematics, it's possible to give classical mathematical tasks, for example, if you imagine that the Earth is an apple, then with what fruit can we compare Mars – watermelon, melon, plum or grain of currant? [1].

The same posters can be used as additional didactic material during observations with a real telescope or during observation of the sky during outdoor activity. For this, it is necessary that the posters be placed in areas of outdoor activity. In this case, the quality of the posters should allow their positioning outside the commissioning of the observatory.

Using this feature aroused interest among all visitors to the observatory. After working with planetARy, all visitors replied that they were interested and they will show the product to their friends and relatives.

At this stage, we expect interest from teachers who wish to supplement their training or outdoor activity with a visit to the Observatory. We are ready to work with teachers on the organization of outdoor activities and supplementing them with visits to the observatory.

Conclusions

The opportunity to conduct such classes is endless and depends mainly on the time and desire of the teacher and students.

We can briefly summarize the main methodological possibilities of using planetARy as follows:

- deepening of astronomic knowledge;
- identification of connections with other academic subjects (mathematics, ICT, art, etc.);
- arousing interest of students;
- the opportunity to diversify outdoor activity;
- others.

The ability to combine modern technology and study among nature can give modern students an incentive and desire to do math and science. It is important to use the available educational resources wisely and not to forget that the most important thing is to teach children to think, love science and enjoy new discoveries.

Acknowledgements

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Geography and economics learning process as a construct for achieving of digital competence

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Abstract: *This article examines the possibilities for the realisation of digital competence of students through the educational process of geography and economics in Bulgarian secondary school in the context of the current educational trends at the global level and the current regulatory framework for education in Bulgaria.*

Keywords: *geography education, geography and economics, key competences, digital competence, digital literacy, ICT, The Digital Competence Framework*

"You are terrified of your own children as they are children of the digital world (digital natives), where you will always be digital immigrants."

John Perry Barlow, Electronic Frontier Foundation

"The teacher cannot remain 'analog' in the digital world of the modern student."

Snezhina Georgieva, teacher of geography and economics

Contemporary social trends imply a new educational concept that is linked not only to all the traditional tasks of education, but also to the preservation and reproduction of intellectual and ethical norms, which are not merely a collection of specific knowledge, but also a competence for the student to discern what knowledge he needs and how to put it into practice. This arises as a natural pattern, due to the changing competency requirements of those involved in the labour market as a result of evolving technologies and the changing parameters of civil society. In recent years, one of the trends that has most strongly influenced both public life and the life of the individual is digitalization. Frequently, the concepts of computerization and digitalization are identified, which warrants a closer examination of the concept of digital. The term is derived from the combination of the words digital, from the Latin digitus, with the original meaning "referring to the fingers" and native from the Latin natus – "received by birth". Today,

the idea of native has not changed, but digital, instead of being used originally, refers to numbers when encoding computer data. This gives us reason to determine generally that digital communication is information sharing, and any kind of interaction with other Internet users, through digital tools. The widespread use of various digital devices in all aspects of life naturally implies the notion of digital literacy, which is generally defined as a set of competences necessary for the full participation of an individual in contemporary society through knowledge, skills and behaviours involving the effective use of digital devices – smartphones, tablets, laptops and desktops for communication, expression, collaboration and training. Initially, the concept of digital literacy defines skills for working with a desktop computer and gradually shifted to network devices, including Internet and social media. The term 'digital literacy' itself was defined by Paul Gilster in his book *Digital Literacy* as the use and perception of information in the digital age, emphasizing the importance of digital technology as an 'essential skill in life' [1].

Digital literacy is different from computer literacy and digital skills. Computer literacy as a precursor to digital refers to the knowledge and skills of using traditional desktops. Computer literacy focuses on the practical skills of using the operating system and various software applications. Digital competence is a modern term referring to the practical skills of using digital devices in relation to obtaining, reading and using information, to acquire knowledge, to create information and to be critical of what is written. A digital literate is considered an individual with a set of skills and knowledge of various digital devices and computer networking skills. At the same time, digital literacy also involves engaging and communicating in online communities and social networks, following a specific code of conduct. Participants in this process can detect, capture and evaluate information. Digital literacy requires the individual to understand the public issues raised by digital technology and to have critical thinking skills. These skills can be acquired through digital experience that provokes thinking in various ways, through multiple media platforms. The evolution of digital media is quickly becoming a part of digital literacy. In this context, it is necessary to emphasize that digital literacy does not replace traditional forms of literacy, but rather builds on them, thus creating opportunities for people to communicate and learn in different ways. In addition to critical thinking skills, digital literacy includes ethics and standards for online behaviour. The importance of digital literacy is also determined by the fact that it is one of the nine core elements of digital citizenship. Many digital literacy researchers look at various aspects of digital literacy, such as how people find, use, summarize, evaluate, create, and announce information while using digital technologies. Research also covers a variety of hardware platforms, such as computer hardware, cell phones, mobile devices and software or mobile applications, including web search or Internet applications. The study of digital literacy is much more about how people learn to use computers.

Digital competencies are key competencies to learning, working and being active in society. It is equally important for school education to understand these competencies and to know how to support their development [2].

Digital competencies are among the eight key competences and relate to criticality and confidence when using the full range of digital information, communication and basic problem solving technologies in all aspects of life. According to the 2015 Dashboard of the European Digital Agenda, 40% of the EU population does not have enough digital competencies – including 22% who do not use the Internet at all. The importance of these competencies is also underlined by the DigComp framework developed by the European Commission, which includes five areas: information literacy; communication and cooperation; creation of digital content; safety and problem solving. All these areas combined include 21 competencies.

According to a report from the Eurydice Network (2012), almost all European countries have a specific national strategy for digital competences. The report shows that during this period digital competences are taught through a cross-curricular elementary course approach in almost all EU countries (with the exception of two) and a secondary course in all countries, in addition to other approaches used in several countries, such as integrating ICT into specific disciplines or teaching it as a separate subject. Research has suggested that the development of digital competences should be developed from an early age, which is largely due to the fact that many areas of our daily lives are becoming increasingly "digitized", namely work, competitiveness and market participation, education, leisure, inclusion and participation in public life. All this as well as the fact that information and services become more and

more accessible through the internet shows unequivocally that digital competences are extremely important for participation in today's economy and today's society.

One of the leading contemporary researchers in digital competency for citizens and the application of ICT for learning and skills, Dr. Reina Vuorikari shares in her expert article that "digital skills are transferable and help us master other key competencies as communicative competencies, language skills or basic skills in mathematics and the natural sciences" [3].

Digital competence today requires not only access and management of ICT, but also relevant knowledge, skills and attitudes related to them. According to a 2014 study of digital inclusion and digital skills in the EU, up to 47% of the EU population does not have sufficient digital competencies – including 23% do not have any digital skills. Digital competence is not just about knowing how to surf the web. They contain a number of other components.

In The Digital Competence Framework 2.0 [4], the European Commission identifies key components of citizens' digital competence in 5 areas, which can be summarized as follows:

- ✓ Information and data literacy: be able to formulate information needs, find and retrieve digital data, information and content. Assess the importance of the source and its content. Store, manage and organize digital data, information and content;
- ✓ Communication and Collaboration: It can interact, communicate and collaborate through digital technologies, while taking into account cultural and generational diversity. May participate in public life using public and private digital services. Can manage its own digital identity and reputation;
- ✓ Digital content creation: can create and edit digital content, improve and integrate information and content into existing knowledge management systems, while understanding how copyrights and licenses apply. Knows how to comprehend instructions on a computer system;
- ✓ Security: can protect digital devices, content, personal data and privacy in a digital environment. He knows how to protect physical and mental health, and knows the potential of digital technologies to enhance social well-being and social inclusion. Aware of the environmental impact of digital technology;
- ✓ Problem solving: can identify needs and problems, and solve conceptual problems in a digital environment. It can use digital tools to create innovative processes and products. Maintains up-to-date knowledge of digital evolution.

All of this calls for a change in education policy at all levels, as well as in teacher preparation, competencies and strategy. This is dictated not only by the specific social requirements, but also by the fact that, in practice, contemporary students are daily taking the digital world with them in a classroom, suggesting new teaching methods that meet the expectations, interests and lifestyles of learners.

According to the current regulatory framework in the Bulgarian secondary school, students are given opportunities to acquire digital competences in all stages and classes, both by studying specific subjects and by mastering them through other subjects.

Table 1. Digital competence courses [5]

stage	course subject	class
First Stage of Primary	Computer Modeling	III, IV
Second Stage of Primary	Information Technology	V, VI, VII
First stage of Secondary	Information Technology	VII, IX, X

Digital competence is enshrined as a core competency in curricula and other disciplines, ie. the organization of the whole educational process in Bulgarian school creates conditions for the students to acquire, upgrade and improve their digital competences in the course of acquiring secondary education through activities for the acquisition of key competences, as well as establishing cross-curricular relations. This leads us to accept that the educational process of geography and economics is a construct for achieving digital competence. Drawing on the curricula for general education in geography and economics in Bulgarian school, we outline the activities and cross-curricular links through which students should acquire digital competence (Table 2).

Table 2. Digital competency acquisition activities as well as cross-curricular links in geography and economics education at the upper secondary level

class	activities	Cross-curricular links
V [6]	Use of ICT to search, collect, present and share information.	Information Technology: Performs tasks related to searching, finding and processing information on certain topics in the global network. Prepares multimedia presentations on a given topic.
VI [7]	Use of ICT to search, collect, present and share information.	Information Technology: Performs tasks related to searching, finding and processing information on certain topics in the global network. Prepares multimedia presentations on a given topic. Provides answers to geographical questions, reports and messages using word processing programs.
VII [8]	Use of ICT to search, collect, present and share information.	Information Technology: Performs tasks related to searching, finding and processing information on certain topics in the global network. Prepares multimedia presentations on a given topic. Provides answers to geographical questions, reports and messages using word processing programs.
VIII [9]	Use of ICT to search, collect, interpret , present and share information to accomplish a specific task. Using multimedia to present products from a specific task.	Information Technology: Performs audio and video information preparation on the Internet. Uses, creates, shares and organises common documents (text document, spreadsheet, form, etc.) and events (calendar) on the Internet for teamwork.
IX [10]	Uses electronically based information sources to search, collect, interpret, present and share specific geographical and economic information. Uses information technology to create and present products from a specific task.	Information Technology: Uses skills for searching and organizing information and develops critical attitude towards electronically based information sources. Uses and enhances skills to create and present products from a specific task. Develops digital culture.
X [11]	Uses electronically based information sources for searching, collecting, interpreting, presenting and sharing information. Creates and presents multimedia products when performing a specific research task.	Information Technology: Creates, processes and stores graphic, text, audio information and combines it. Uses computer programs to work with text, graphics, sound, video, spreadsheets, presentations and combining them. Uses and works with multimedia information.

Curricula for individual subjects, in particular geography and economics, are those normative documents that specifically define both the curriculum content that students should master and the

learning objectives indicated as expected outcomes in the form of competences that follow to be achieved. On this basis, teachers need to design a course-based learning process so that the goals, objectives and expected results are met. This leads us to accept that digital competence, as enumerated in the normative documents, should also be attained at the end of the course in the subject, constructed through the specifics of geographical knowledge. From the information presented in Table 2. we can conclude that:

- ✓ In all grades of Bulgarian secondary school, digital competence is achieved by establishing cross-curricular relations mainly with the subject of information technology;
- ✓ In the upper secondary stage, it focuses on tasks such as searching for, finding and processing information on specific geographic topics in the global network as a result of which students are expected to make multimedia presentations on a given topic, answer geographic questions, reports and messages. The completion of these tasks implies that students have, in addition to the ability to search and select information on the Internet, and the ability to use word processing and presentation programs;
- ✓ At high school level, students are expected to use multimedia in geography and economics classes to present products from specific tasks, which are realized on the basis of electronically based information sources by searching, collecting, interpreting, presenting and exchanging specific geographical and economic information, with the focus on teamwork.

On the other hand, a number of electronic resources have been provided in the educational and cognitive process of geography and economics in recent years, with the most popular being the electronic textbooks on the subject. With few exceptions, they are practically available from all textbook publishers.

One of the main tasks of modern Bulgarian school education is the formation and education of digital culture among the students. This is due to the fact that information technology has practically entered into all spheres of human society and is achieved "... both through the study of information science and information and communication technologies (ICT), and through the application of the knowledge acquired therein, skills and competences in teaching in all subjects, including geography and economics" [12].

The function of electronic resources is to supplement the actions of the teacher by freeing up teaching time in which he or she can more effectively exercise the various roles of coordinating, directing, supporting, motivating, controlling the cognitive activity of learners. The use of electronic resources supports the organization of students' educational and cognitive activity, contributes to the formation of their geographical competences and provokes the development of creative potential and critical thinking.

Online textbooks do not replace the classic textbook, but rather accompany it to meet the needs of modern learners.

All presented e-textbooks meet the set criteria and are of high technological level, methodologically and scientifically substantiated.

In these, the authors offer students and teachers a wealth of additional materials for each lesson, namely: maps, photos, video, sound, games, 3D computer animations and simulations, various hyperlinks to resources on the web. The online textbooks include interactive tests of self-control and self-control, which allow for real-time evaluation and rearrangement of distractors.

The electronic textbooks of "Prosveta Plus Ltd" and "Prosveta - Sofia AD" have been developed on the basis of the Portable Document Format (PDF) using the Mozaik Education platform for innovative educational solutions (mozaBook). The electronic textbooks of "Bulvest 2000" and "Anubis" publishers also use Portable Document Format (PDF). They are online based.

A brief overview of the e-textbooks of geography and economics in high school can lead to the conclusion that:

- ✓ The e-textbooks examined successfully contribute to the formation of knowledge, skills and values of the learners, support the process of perception and meaningful learning, motivate the learners to apply knowledge, through various activities, support by illustrating the relevant unit, provide additional information about the subject theme;
- ✓ The opportunities offered by e-textbooks in geography and economics allow the construction of learning activities that, on the one hand, actively develop students' digital skills and, on the other, motivate them to be active participants in the learning process.

The direct observations on the organization and realization of the educational and cognitive process of geography and economics in the secondary and high school stages in the schools in Sliven district show that the teachers skillfully combine the traditional, classical methods of teaching such as school lecture, conversation, discussion, work with wall geography map and geographic atlas using ICT and interactive methods. This makes the learning process effective, dynamic, interesting and preferred by learners. It is, of course, necessary for the teachers themselves to have digital competences and to be able to apply them properly, so that they can realize the lessons according to the new normative requirements, public attitudes and interests of the students. Observations show that this organisation of the learning process is preferred by young teachers between the ages of 25 and 35. In their work, in addition to e-textbooks, they also use other electronic resources such as: educational presentation software mozaBook, Hot Potatoes, Quizizz, Smartest, Google classroom and others.

Teachers with more seniority and age have digital competences different from those of their younger counterparts and adhere mainly to classical teaching methods, which make it much more difficult to motivate students to work.

From all of the above it can be concluded that education, in particular geography, which is closely related to ongoing global processes, is undergoing a digital transformation. This is directly correlated with its contemporary goals and objectives, and one of its main tasks is the realization of digital competence as one of the key competences of learners.

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A model for the development of communicative and presentation skills in the English tuition of university students

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Abstract: *The purpose of this paper is to present a sample teaching model for development of communicative and presentation skills in the English tuition of students from the bachelor degree courses: Biology and Chemistry, Biology and English, of the Biology Department at the University of Plovdiv. The English tuition model is based on the textbook "English for Biology Students" – author G. Stankova, where there are tasks that help master students' communicative skills in English. Highlights of the teaching model research work are: 1) to select and include the sections from the textbook that are related to the purposes of the research; 2) to get students ready to make a multimedia presentation in the context of the topics covered; 3) to organize the implementation of a system of tasks by using interactive teaching methods. The following algorithm of the communicative process is in the basis of the model: starting a presentation; using a "survival" language during a presentation; how to deal with the nervous tension when speaking to an audience; preparing a mini-presentation as an element of the evaluation-resultative component of the teaching process; verbs that express changes when presenting results and indicators.*

Keywords: *teaching model, development of communicative and presentation skills, presentation, mini-presentation*

Introduction

The theory of communication and the process of communicative skills development have been extensively studied. Communication is the basis of almost every human activity. There are specific methodology requirements for the development of communicative and presentation skills in the particular professional training of future specialists.

The present study aims to explore the possibility of developing communicative and presentation skills through the created didactic model in the English tuition of students-biologists and educationalists; the study presents a sample working model with students from the bachelor course Biology and English –

in English, according to the curriculum in the discipline English for Biology Students, which is taught in 5th semester, 3rd year; and the bachelor course Biology and Chemistry as an optional discipline – English language, 1st semester, 1st year. Students who have completed these courses acquire teaching qualifications. Thus, this fact determines the great importance of the development of communicative and presentation skills as a major part of students' key competencies.

Material and methods

The methods applied in this study were: a critical review of the specialized literature on the problem, didactic modeling of a methodical model for the development of communicative and presentation skills in students from the pedagogical courses of the University of Plovdiv, Biology Department, in the subjects: English for Biology Students and English language.

The present teaching model is mainly based on the textbook "English for Biology Students" that has been used for many years [1]. The textbook comprises 6 Units; each unit has 4 Sections – A, B, C, D. The Sections A of each unit work with developing of various communicative skills – speaking, presenting (Table 1– in green), and writing; the Sections B – grammar; Sections C – vocabulary; Sections D – biology.

Table 1. The content structure of the textbook

Units	1	2	3	4	5	6
Sections						
A	Speaking	Speaking	Speaking	Speaking	Speaking	Writing
B	Grammar	Grammar	Grammar	Grammar	Grammar	Grammar
C	Vocabulary	Vocabulary	Vocabulary	Vocabulary	Vocabulary	Vocabulary
D	Biology	Biology	Biology	Biology	Biology	Biology

The main focus and purpose of the research are the development of a methodology model in several steps, which integrates: units from the textbook; a system of tasks; a multimedia presentation, based on a reflective approach, as current control assessment; relevant vocabulary sections; formal and scientific correspondence.

Results and discussion

Theoretical analysis of the problem

In the specialized literature, the problem of communicative and presentation skills has been repeatedly developed, but its development is directly related to technological advancement and the development of teaching methods, thus, this keeps the topic up-to-date.

The development of key competences is a paramount task that is basic for most of the European Union's strategies for growth, sustainable development, and jobs for young people and improving their educational attainment. Among the very first key competences, classified by the European Reference Framework [2], are: native language communication, foreign language communication.

The essence of the communicative process has been interpreted by many authors. According to Roland Burckart, the word "communication" has become a fashion label in our everyday language. As a rule, the usage of this word is something quite ordinary: messages between people – the fact that we are transferring some messages to each other ... This is just the daily routine that hides, to a large extent, the complexity of the process that stays behind this transmitting [3].

Todor Stoev defines the presentation as "an interactive dialogue, and that a good presentation can be a powerful channel for communication – through it the message can reach an important group of people, ie. conditions for a dialogue on important issues are created." [4].

Communication is an interpersonal process, in which some information is transmitted, but it also has rich behavioral content. Vakleva Zl. claims that "communicative competence is not an innate ability, but it is formed by the interaction between people and their social environments" [5].

In this context, it should be sought the connection between the communicative, presentation skills and the pedagogical tuition of the students, trained as future biology teachers, and the formation of key competences in their foreign language communication. Moreover, the list of job descriptions of a teacher's position includes the requirement to build relationships and valuables, skills and general knowledge, and a teacher's communication skills are in the first place.

Teaching methodology model

Communicative and presentation competencies are acquired in many subjects in accordance with the academic curriculum at universities; one of these subjects is English. It is also quite motivating to point out the important role of presentations in contemporary society, a role that most students have already realized. In this aspect, it is a good practice to introduce students to the communication option – presentation (eg, when presenting a coursework, preparing talks, presenting various indicators, reporting survey results to colleagues or faculty, etc.), where students will need to form and upgrade their presentation skills.

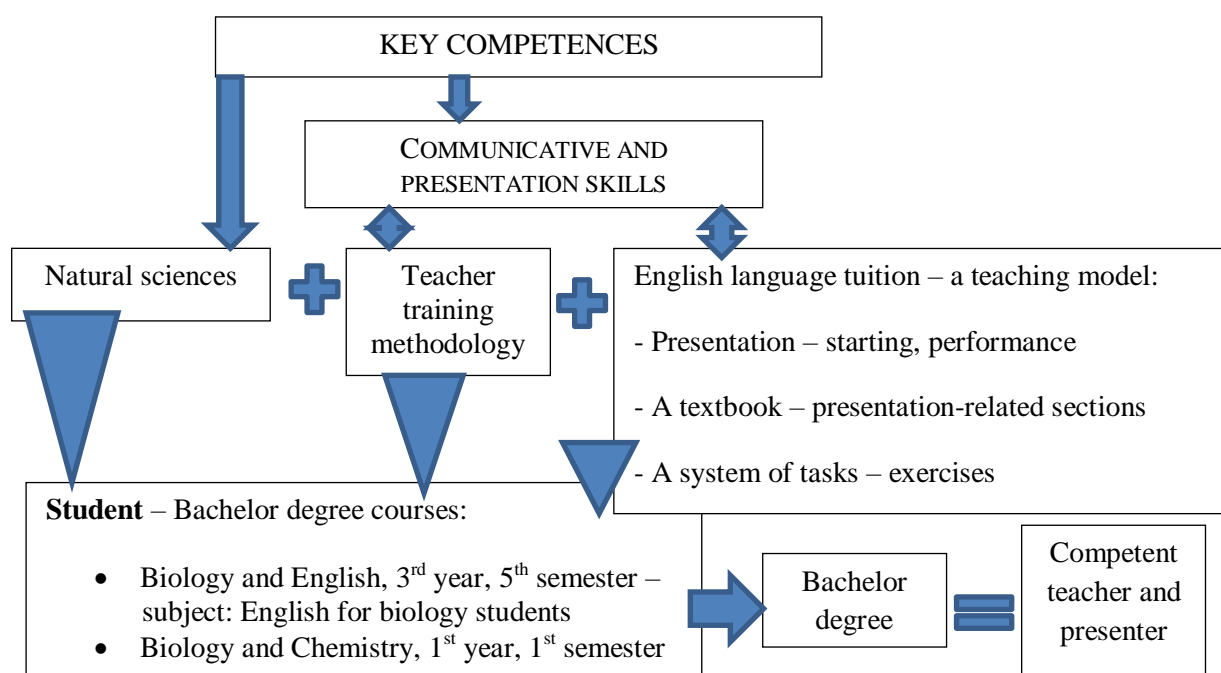


Figure 1. Teaching methodology model

For the purposes of representing the sample teaching model, only the presentation-related sections are shown below (Table 2), to introduce the teaching methodology.

Table 2. Content analysis of the sections from the teaching model

Units	Sections	Teaching methodology for development of presentation and communicative skills
2	A	1) Starting up a presentation (structure, steps) – theoretically, demonstration as a roleplay; 2) New vocabulary (phrases, expressions, collocations) that can be used at starting a presentation – exercises (gap-filling); 3) The usage of the so called "survival language" during a presentation – example sentences.
3	A	Phrases for stating the purpose of a presentation – matching and gap-filling exercises.
4	A	1) How to deal with nerves during a presentation (some tips) – theoretically; 2) Verbs that describe changes (e.g. <i>increase, fall, stop rising or falling, etc.</i>) – lists, gap-filling and matching exercises.

5	A	1) Preparing a mini-presentation on the biology topics – a self-study task as an element of the evaluation-resultative component of the tuition, so forming the final grades; 2) Filling a chart list, with given criteria, for self-assessment – intergroup work on the basis of the reflexive approach in assessing the presentations; discussion.
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Section A of Unit 1 is a speaking lesson, while Section A of the last Unit 6 is referred to formal letter writing; that is why they are not included in the present study, as being not related to oral presentations.

Section A of Unit 2 gives the starting structure of a presentation. The introductory words explain how presentations are less formal than in the past. Nowadays, most audience prefers a relatively informal approach. However, there is a certain structure that should be followed at the various stages of the opening of a presentation. Figure 2 shows the five steps that should be observed for starting up a presentation [6].

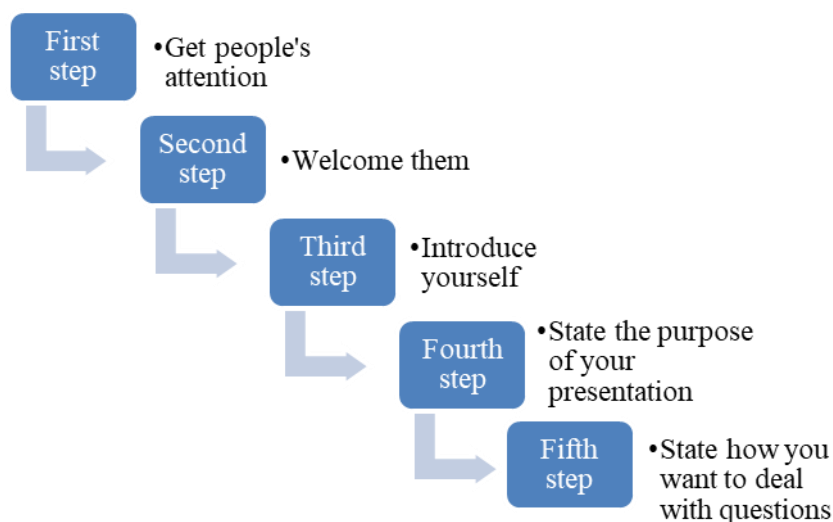


Figure 2. Certain steps for starting a presentation

The teacher starts Section A of Unit 2 as a presentation game model, the situation is role-played by the teacher, using selected expressions from those that students will later work with, and strictly following the steps for starting a presentation. This is the second unit of the textbook, i.e. the teacher and the students have already worked out the four sections of the first unit, so they have known each other relatively well. Thus, the students are genuinely surprised, when it comes to the second and third steps, because they are welcomed in a very formal way and given well-known information – the teacher's name and responsibility for their English tuition, on behalf of the Biology Department, etc. This definitely catches their attention, and then the purpose of this presentation is stated, namely how to start a presentation.

It is very important, after attracting the attention of the audience, with appealing and minor expressions in the first step, then to proceed to the second step, namely to welcome those who have come to see and hear the presentation, i.e. to address a personal message in this type of communication.

After the opening organized in such a way, the fourth step follows, which clearly states the purpose of the presentation – exactly what information will be given, reported, discussed.

And last but not least, the fifth step is to give a specific plan when to ask questions, to state how the presenter wants to deal with questions. Usually, the emphasis is placed on the importance of the fifth step, since the success of an entire presentation very often depends on how this part is organized. Here, the teacher's personal experience can be shared: once, presenting a teaching methodology study with many graphs, diagrams, slides, an excellent presenter got confused with the hands raised for questions at a conference, because the presenter had failed to announce specifically how he wanted to deal with questions; then he asked the audience to leave the questions until the end, however, there was a big

disturbance with the slides, and this spoils his otherwise brilliant speech. The example is particularly eloquent, and even in the opening of a presentation, the person presenting the information should have organized the work very well at this stage, in order for the communication to flow smoothly and clearly for both transmitting and receiving parties involved.

The exercises for development of communicative skills in Section A of Unit 2 are given as language tasks to master new vocabulary [6]. For each of the five steps for the beginning of a presentation, ready-made sentences and expressions (3-4 for each step) are given, with gaps that students should fill in, while the missing words shuffled are in a box above the expressions (Figure 3).

Complete the sentences with a word from the box

If for get Perhaps responsible ladies behalf
those attention charge Marketing

1 Get people's attention

1. If I could have everybody's _____
2. _____ we can start.
3. _____ we should begin?
4. Let's _____ started.

2 Welcome them

1. Welcome to Microsoft.
2. Thank you _____ coming today.
3. Good morning, _____ and gentlemen.
4. On _____ of Intel, I'd like to welcome you.

3 Introduce yourself

1. My name's Jane Shaw. I'm _____ for travel arrangements.
2. For _____ of you who don't know me, my name's Tom Stotter.
3. As you know, I'm in _____ of public relations.
4. I'm the new _____ Manager.

Figure 3. Exercises for development of communicative skills [6]

This section of Unit 2 also includes example sentences that can help students be able to use the so-called "survival language" during a presentation, i.e. how to "survive" in complicated or confused situations during the speech, e.g. if you get your facts wrong, if you have forgotten to make a point, if you cannot remember a term, if you are short of time, etc.

Stating the purpose of a presentation clearly is exclusively important for a good speech; Section A of Unit 3 provides general information with phrases and ways to do this. Students do matching and gap-filling exercises to practice how to state the purpose of their talk in order to develop and improve their communication skills.

From a psychological point of view, the nervous tension that a presenter feels when speaking in public is one of the most common fears of people – shame, fear of mistakes, fear of failure. Section A of Unit 4, in a pleasant and friendly way, starts with some very useful pieces of advice how to overcome this anxiety and how one can stop oneself from feeling too nervous. These helpful tips included in this section are intended to encourage students to control and overpower that tension, in order to make their oral presentation smooth and calm, rather than being in panic, having a destructive behavior or causing communication disruption. Moreover, it is a matter of great importance just for these students who will acquire teaching qualifications and will have a daily appearance in front of an audience and communication with their future students.

An important point in developing of communicative and presentation skills, from a linguistic point of view, is Section A of Unit 4, which upgrades students' knowledge with a wide variety of English verbs related to presenting of qualitative and quantitative indicators or generally speaking – verbs that describe changes occurring in different parameters (e.g. decrease, increase, fluctuate, peak, etc.) [6]. Taking into account that the university students, especially these that are taught in the two courses, may also work in scientific, experimental, or pedagogical spheres, such skills acquired are of paramount importance to them

for reporting or recording (e.g. results, comparison of various indicators, values, etc.) in a foreign language.

Section A of Unit 5 represents some methods and exercises that can get students ready to prepare a mini-presentation on some news and topics from the mass media [7]. For the purposes of the present teaching model for communicative competence development, the themes in the section have been changed, in order to turn the specific students' teacher-training into practice by providing them with clear explanations and instructions how to prepare their presentations (not longer than 2-3 minutes) and to cover already taught general biology texts from the textbook. The goal of that task is students to work and master their knowledge on well-known scientific factual material, and in such an interactive way, with the means of computer technology, e.g. a multimedia projector, a slide show, to present themes that are known and familiar to both sides of the communication process – the presenters and the audience.

The preparation and presentation of the task can be given either as coursework or as a self-study assignment, and it can be used as an element of the evaluation-resultative component of the teaching process, as a final grade. For the course Biology and English as an oral exam in the discipline English for Biology Students, where the final grade is formed in percentages, and it also includes points from current control tests, equated to a six-point scale; while for the course Biology and Chemistry – as an aspect of current control tests to form a final grade.

The clear and certain criteria for assessing a presentation performance quality are as follows:

1. Selection of one of the studied biological topics from the textbook;
2. Length of the presentation (about 3-4 paragraphs), so that the preset duration of the presentation (2-3 minutes) to be observed;
3. The five steps for opening a presentation must be included - Section A of Unit 2 (Figure 2);
4. The usage of "survival language" expressions and/or phrases learned for a clear stating the purpose and topic of a presentation;
5. The text should be presented clearly, smoothly and persuasively, with verbal clarity when interpreting the content;
6. Language correctness and ease of presentation in the foreign language;
7. Artistic skills – presenter's voice, position, pose, gestures, etc;
8. Visual aids and/or slide show quality.

Particularly useful for the presented teaching model would be the idea that some students to get ready to ask questions that have been preset together with the presenter, in accordance with the stated presenter's plan for questions; thus, the performance will be more vivid.

In past years, this interactive situation was acted out with students whose final grade at the end of a semester was unstable or varied, and their final mark depended on their performance at the presentation.

Basing on the reflexive approach, proposed in Section A of Unit 5, the textbook offers an interesting way of assessing students' performance, as well as self-evaluation, in order to select the best presentations. Students complete cards with listed presenters and the certain criteria that should be met. Everyone can add or take points according to the fulfillment of the criteria, so the presenter that has the highest score is the winner or, in the same way, the best presentation-selected.

Conclusions

From the methodical approach of work proposed for the development of communicative and presentation skills in the English language tuition of students from the teacher-training courses, the following conclusions can be drawn:

1. The development of communicative and presentation skills in pedagogical students is a complex and multidimensional process that is based on extensive experience, however, it develops dynamically in a technological and methodological aspect.
2. In order to be effective, the educational process for the formation of communicative and presentation skills in students requires a specially developed teaching methodology model, in the context of the discipline taught, and supplemented by a specialized complementary textbook.
3. The teaching methodology model developed by us has been tested in real learning environments, and its positive results obtained can be subject to experimental research work.

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