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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 nativus – "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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