

Basic Knowledge of Software and Web Content as Elements of Social Programming in Education

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Abstract. For any specialist, basic knowledge of his or her specialty is like a "daily routine" that should create comfortable conditions for the realization of basic professional tasks. At the same time, the changes brought about by the transition to a remote format of communication, professional activity and the need to use the mechanisms of the information society affect the basic process of socialization, formation and development of personality. This process is part of the educational process - the "knowledge acquisition routine" or social programming that meets the needs of the state, society, national culture, etc. And it cannot have primary and/or secondary aspects.

That is why the task of our research on this topic is to try to figure out what basic knowledge of software and web content, including programming skills, can be the necessary minimum in teacher training for everyday activities in the digital world (including the needs of society and the interests of children/youth). What should be a prerequisite for quality interaction between teachers, subjects and objects of the educational process in the digital world. In particular, what format, ethical norms and legislative aspects of regulation of the digital educational process, including relevant content, should be the basis for such interaction.

Keywords: education, social programming, software, web content.

I. INTRODUCTION

The digital educational environment is something that sounds like a commonplace today and does not cause a definite «no» from parents and teachers. But at the same time, we, as those who train pedagogical specialists and those who are already involved in this process, need to understand for ourselves what exactly digital transformation in education is. What part of it should become an integral part of the skills of teachers and their students.

In the current realities and flow of information, scholars and practitioners identify «five key areas associated with primarily professional attributes:

1. Communication skills, including language and presentation of ideas.
2. Collaborative skills, including management of group activities and social interaction.
3. Individual learning approaches, including critical thinking, metacognition and new skills acquisition.
4. Individual autonomy, including flexibility, adaptability and entrepreneurship.
5. ICT and digital literacy, including the use of technology as tools for learning, communication and

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collaboration» [1]. Thus, the same authors – C. Joynes, S. Rossignoli and E. Fenyiwa Amonoo-Kuofi – note that «digital literacy in the 21st century context indicates individual confidence in the use of media and ICT and proficiency in the use of digital tools, plus interactive digital skills, critical use of digital tools (analysis, critique, evaluation, creation), and the ability to attend to ethical responsibilities required in participatory culture in technology», which will correspond to «four overarching 21st century competencies' that should be integrated into existing educational systems: lifelong learning, problem-solving, self-management and teamwork» [1; 2], and will also ensure interaction within the «three dimensions for learning in the 21st century: information, communication, and ethics and social impact [1].

This approach is being further developed in the field of education in accordance with the results of the analysis of the current development of ICT in education, in particular, according to the report on Objective 1 «Benchmark progress in ICT in schools», «focusing on: access to and use of digital technologies; digital activities and teachers' and students' confidence in their digital competence; ICT-related professional development of teachers; students' digital home environment and schools' digital policies, strategies and opinions» [3].

As D.Gannon notes, to achieve the main purpose of education in the digital world, «a wide range of software is now available for use in education, including applications that were not specifically designed for the education sector» [4]. In addition, «by using ICT integrating methods and strategies to different aspects of learning one can promote more meaningful and congenial learning environment in terms of active, collaborative, creative, integrative as well as evaluative learning» [5].

And at the same time, when it comes to the possibilities of education in the modern world, we start talking about teachers, educators and professors who must «keep up with the times». In this sense, we need to understand that educators who are not connected to technology and who use the simplest skills are not ready to move to the digital era. After all, they have a shortage of time (sometimes even personal time) in their arsenal of daily tasks and communication with colleagues, students and their families. This also slows down the pace of digitalization of education.

This thesis is supported not only by our research, but also by a similar opinion in various foreign publications, particularly from developing countries. Thus, among the root causes that prevent teachers from fully mastering IT and unlocking its potential in the educational process are: the barrier of budgetary constraints, the lack of Internet access at the workplace, and sometimes even the equipment to demonstrate the necessary materials (projectors, whiteboards, laptops, etc.), it is also important to mention here that various studies have highlighted other barriers such as lack of proper vision and planning as well as social, cultural and political realities. School leaders and teachers'

negative attitude towards technology use; lack of knowledge and skills required; time shortage are among the major barriers that hinder the successful use of technological tools that would enhance the attainment of required skills in different work sectors [6].

However, in our opinion, considering the basic terminology and understanding of software from the perspective of non-IT specialists can help teachers feel confident in using technology in the educational process. That is why we have chosen the following as the *purpose* of our scientific review: to determine the necessary minimum of basic knowledge of software and web content for a teacher to work in a digital educational environment and its impact on the future generation through social programs that are «approved» by society.

And the main *objective* that follows from the purpose of this review is to analyze the terminology and technical software from the point of view of social programming in education and to present pedagogical theory and practice on this issue.

II. MATERIALS AND METHODS

We, like most Ukrainian teachers (who did not study IT specifically), used information technology in the preparation of scientific, educational, theoretical and practical materials in our practice. However, before the challenges posed by the 2019 pandemic, we limited our interaction with technology in the classroom to the results of work in office editors (Word and PowerPoint), and this was sufficient to ensure the quality and effectiveness of the educational process. Students chose whether to prepare with books from the Living Library or from libraries available on the Internet.

At the same time, the changes that education in Ukraine has undergone since 2019 have outlined the need for an «ordinary teacher» to «immerse himself in the digital era and digital learning environment». That is why it was and is a priority for Ukrainian educators to understand what the digitalisation of education is and to find out what basic software they have in their «arsenal».

Therefore, the main methods we used in this study are:

- studying, analysing and summarising information from specialised literature in the fields of IT and education on basic software and web content;
- analysing the interdependence of the concepts of social programming and skills in using software and web content
- highlighting the basic software and web content for developing the skills of a modern teacher in a digital educational environment.

III. RESULTS AND DISCUSSION

In order, to fulfil the *research objectives*, we analysed the literature that is currently freely available and turned to

the basic terminology of our study. First of all, we must understand that «software is a set of instructions, data or programs used to operate computers and execute specific tasks. ... is a generic term used to refer to applications, scripts and programs that run on a device. ... The two main categories of software are application software and system software» [7].

In the scientific and technical community of Ukraine, it is customary to use «a general concept that describes computer programs as opposed to its hardware components. It does not specify in what form the programmes are presented (in source code or executable code). Software is divided into two broad classes: system software and application software. System software includes any software required for the development and execution of programs, such as operating systems, compilers, debuggers, and so on. Examples of application software include accounting programs, educational programs, computer games, CAD, etc» [8].

However, it is more relevant for us, educators, to understand the following division of the software offered by D.Gannon in our daily routine of teaching. It is:

Content-free software. «Also referred to as productivity software, content-free software includes the range of software applications, which may be used in the performance of cross-curricular tasks. Examples of children's use of content-free software include word-processing software to write a report, multimedia authoring or presentation software to create and display work, multimedia software to produce a video clip, concept mapping software to organise ideas, or simulation software to solve a problem in a controlled environment. Software which facilitates the editing of text, pictures, video and sound also comes under the category of content-free software. In this chapter, where the use of software requires or is enhanced by the use of specific input and output peripheral devices (scanner, digital camera, digital projector, digital video, concept keyboard) these devices are included in the discussion for that software type» [4]. By the way, this is exactly the software that teachers constantly use in preparation for classes and events, their implementation, individual and group consultations, projects, group work, and, importantly, even in the absence of technical capabilities in the educational institution.

Software with rich content that «refers to applications, that contain specific curriculum content and provide the child with opportunities to engage with this content using tutorials, practice problems, assessments, feedback activities, simulations and so forth. Examples of content-rich software include reinforcement software for revising maths concepts, reference software for researching a topic or idea, and exploratory software for simulating a science experiment» [4]. This category also seems simple to understand, and this is where the difficulty arises, because at this stage we are already moving to web content, which is inextricably linked to interactive interaction, both in real time and asynchronously, according to the needs and capabilities of the participants in the educational process.

What is web content? According to Ukrainian scholars, the second generation of the web, which arose as a result of the need for interactive interaction among users of Internet services and the emergence of «new technologies for developing websites and presenting their content that facilitate the dialogic sharing of information, interaction (interoperability) and cooperation on the World Wide Web. Examples of Web 2.0 include: communities built on interaction in the WWW, web services, social networks (Facebook, MySpace, etc.), video hosting (YouTube), wikis (Wikipedia), blogs, mash-ups (mash-ups are web applications that combine data from multiple sources into one integrated tool, thus creating a combination of functionality in one web interface) and folksonomies (folksonomies are systems that allow users to collectively (collaboratively) classify and search for information). Sites in this category allow users to interact with other users or modify the content of websites, as opposed to websites where users are limited to passively viewing information» [8].

Thus, a teacher who uses web content in his/her practice to interact with students already has the appropriate skills to fulfil the purpose of the digital learning environment, but then a reasonable question arises whether this is enough and at what level these skills should be presented?

Here, we will use a study conducted in Ukraine to help us rank the respondents, which revealed the reasons for the low use of ICT in the educational process in 2016. For example, only 12% of respondents systematically use ICTs, 64% use them occasionally, and 11% do not use them (according to the study, 8% do not use them because they are not available and 3% do not see the need for them), and clarifying questions allowed the authors of the study to identify that the main reason is the lack of high-quality electronic educational resources for educational purposes (74% of teachers) and 5% of respondents indicated that preparing for an ICT lesson takes a lot of time [9]. Thus, three of the previously identified problems of digitalisation of education were identified and confirmed, which also demonstrated the lack of relevant knowledge of basic software and web content that would allow for the rapid creation of non-standard, game-based content for a regular lesson and teachers' own understanding of the benefits of expanding the use of ICT/IT in the educational process and the acquisition of relevant digital skills.

In contrast to this attitude to IT in education, we can note that «the conceptual shift in the paradigm is due to the transition from a content-oriented approach to a process-oriented one, according to which learning is understood not as the acquisition, accumulation and reproduction of knowledge, but as the formation of the ability to comprehend, explain and interpret it» [10]

Therefore, a game – game applications, mobile games and applications, online platforms – are becoming an integral part of the educational process and only deepen their impact on the development and formation of the individual, occupying one of the main positions in the formation and development of skills necessary for successful adaptation and socialisation.

Thus, we can move on to **analyse the interdependence of the concepts of social programming and skills in using software and web content and understand what exactly unites them in the digital educational environment.**

For example, according to V.Terziev research, we consider first of all the interpretation of the term «programme», which usually includes: «*action plan at work; statement of basic principles and objectives of the activity of political parties, organizations or individuals; a summary of the content of a school subject; an ordered sequence for action embodying an algorithm for solving certain tasks*» [11]. Meanwhile, social programme is a promising concept for welfare growth and development of social relations. It gives a general description of the strategy for social development in a particular historical period, the main areas of well-being growth and global qualitative and quantitative indicators to be reached during this period [11].

This is also what the digital transformation in education is striving for. After all, according to the results of the DRIVE LIMITLESS LEARNING project:

«*IT modernization is dramatically changing learning experiences and teaching environments. Digital is also transforming the way institutions of higher education around the world operate. From large research institutions and teaching hospitals to community colleges, digital campus initiatives move academic institutions toward more secure, agile, and cost-effective infrastructure and services, empowering individuals at all levels – from faculty, staff, and administration to that most important stakeholder, the student*» [12].

Such challenges are the driving force for joining forces in education, because the education sector is responsible for implementing «social programmes», state policy on training, retraining and additional education of individuals, who are part of human resources, whose transformation involves acquiring the necessary social skills to ensure the implementation of social policy. And this, in turn, is impossible without «organisational efficiency», which implies the provision of resources, a clearly defined goal as the end result, coordinated with the dynamic social environment, the achievement of which will be based on the choice of an appropriate strategy that will contribute to the achievement of the intended end result [13].

In addition, social programming proper, which is seen as the process of the state's deliberate use of a set of specific methods and means of influencing human consciousness in order to shape or re-shape the consciousness of an individual as a member of society in a certain direction [14], is the deliberate inclusion of an individual as part of society and/or a certain social group in these processes in order to achieve a general purpose.

In our case, all of this should be united by one purpose – the training of a specialist teacher who has the knowledge and skills to use basic software and web content to implement state policy aimed at achieving effective social integration and self-realization of the individual for the welfare and prosperity of each «element» of the state and society.

IV. CONCLUSIONS

So, based on the above, from the theoretical and practical aspects related to the basic knowledge of software and web content, we have come to the following conclusion.

In order to implement the state policy and achieve the main goal of education in the digital educational environment and information technologies, we must provide training and retraining of pedagogical specialists in accordance with the following three levels.

The first level is the user educator, who can perform simple tasks such as preparing materials, providing online learning based on materials that have been transferred to a text editor or created a presentation, sending emails or creating chats with students, creating an online conference and demonstrating presentation materials.

The second level is the innovator teacher, who can use basic software and web content to create non-standard, creative solutions for presenting new material, learning the material studied, connecting game exercises that would be consistent with the gamification of education from already created content, choosing proven, adapted and high-quality game platforms and applications.

The third level is that of the developer, who not only uses developed and available game elements, but also develops them, supplements, improves, and engages children in creating their own content with high-quality, verified information that will work in the long term.

This is the level of teacher training that should be designed for today, because it is not only a challenge of the modern world, it is a digital necessity of the reality in which the digital educational environment operates.

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