

# APPLICATION OF PRINTED TEACHING MATERIALS IN DIGITAL FORM

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## ***ABSTRACT***

*The study focuses on the identification of criteria, limits for the transformation and usability of printed teaching texts and materials in their digital form in the educational process. Based on the identified criteria, the goal is to upgrade the form of printed teaching texts, in accordance with the needs of education in the 21st century, into a digital form. In order to increase the level of competence of teacher students in the field of handling ICT, for their future practice, it is important to appeal to the necessity of integrating ICT into teaching. The output of the study is a concrete demonstration of the transformation of print content into digital form and the presentation of data of a group of students educated in the field of handling digital means and platforms, during their undergraduate training, in a specific subject.*

## ***KEYWORDS***

*Education for the 21st century, digital learning materials, digitization, educational process, undergraduate training*

## **1. INTRODUCTION**

The preparation of a teacher for the implementation of a lesson with the involvement of ICT has its specifics, but it proceeds almost the same as the preparation for any other lesson and is undoubtedly an integral part of the education and training process. It is based on pedagogical documents, without a precisely defined form. According to Roubal [1] the teacher adjusts and adapts it using his own resources. Its length and intensity primarily depends on whether the teacher decides to incorporate some of the already created available methodological and educational materials, or to create new ones. In the first case, before the actual inclusion of the selected material, it is necessary to subject it to a thorough critical analysis focusing on the content and didactic nature of the material, assessment of its suitability, appropriateness, adequacy, consideration of the scope of use, or the need for modification or addition [2]. In the second case, it is necessary to emphasize the difficulty of the process of creating one's own, didactically adequately adapted material, presented with the help of ICT, compared to editing materials created by someone else. According to Hlavatý [3], the collection and processing of information, stimuli, elements, the compilation and selection of engaging content, the selection of appropriate technologies, or the incorporation of interactive elements are particularly demanding on expertise and time. Roubal [4] agrees with this opinion and adds that the above-average development of digitization and the gradual introduction of information and communication technologies into the pedagogical environment also brings with it the need to use digital teaching materials, such as: workbooks and sheets, open educational resources, electronic learning

materials, digital libraries, educational portals, learning objects, multimedia learning resources, e-learning materials. Even if it is a relatively time-consuming process, the return on this investment in time tends to be relatively high in the future, as modified or newly created material, if it is modified or compiled in accordance with all didactic principles and principles, the teacher is able to use in the teaching process repeatedly, possibly with minor changes or additions [5]. The constant development of information and communication technologies –now common means used by students, their family members, but also teachers, in the form of tools designed for communication or processing, storing, making available information, continuously affects the private and public life of each individual to the same extent. A pedagogue wishing and calling for a change in the implementation of lessons in a classic, out dated form should therefore be able to realize the given fact and be able to work with it effectively [6]. When working with ICT in teaching, the teacher must be aware that the focus of the work should rest on the student, who should be able to subject the available resources to a critical evaluation after guidance and to respect and identify with the rules of safe handling of information, hardware, software [7]. Today, the student often has much greater skills in manipulating the computer than the teacher himself, which can be a great benefit, especially if the teacher will be able to incorporate the student's outputs into the learning resources in the future, whether in the form of photo documentation from the excursion, various other visual documentation, video, graph, table or project [8]. Undoubtedly, durability and the possibility of repeatedly connecting the created materials, continuous editing, easy sharing thanks to electronic distribution, economic efficiency, or space-saving storage [9] can be considered a big positive.

## **2. THE NECESSITY OF INNOVATION**

Each society with regard to its members, in the spirit of social discourse, formulates the goals of the educational process. Based on the current state of knowledge, head apt educational contents to these goals. The relationships between goals and contents can undoubtedly be seen as inter related and conditioning. This is proven by the fact that the goals of the educational process cannot be achieved without the implementation of the educational content. The amount of information that needs to be included in the educational process is growing day by day, and therefore it is important to constantly innovate the goals and content of education [10]. The term "innovation", derived from the Latin *innovare* – renewal, improvement, renewal, appears in the works of several authors in the meaning of the process through which an opportunity is transformed into a new idea, which is later incorporated into wide practice. A common feature of the interpretation of the term is primarily change, improvement, a new idea, invention, or application of a new idea [11]. In the sense of the above, bringing digital innovations to schools, whether in the form of purchasing software, hardware, digital platforms or tablets, computers, loses its effectiveness due to the absence of high-quality training of teachers and the absence of their subsequent guidance to the adequate use of ICT resources in teaching. The problem is also that technologies that do not improve or make the learning of students more efficient are mostly wrongly considered innovations in education, but in such a context they definitely cannot be perceived as such [12]. Innovation can be called a new process, approach, strategy, product, through which something can be realized differently - differently. Innovation skills are defined by the Organization for Economic Co-operation and Development (OECD) as three sets of overlapping skills: a) behavioral and social skills – persistence, cooperation, self-confidence, communication; b) technical skills – procedural and content knowledge; c) creativity and thinking skills – finding problems, understanding the limits of knowledge, making connections, questioning ideas, imagination [13]. In the whole process, it is necessary to work with data, knowledge and information. Data can be defined as objects or facts that do not depend on the user in the sense that they document the state of reality at a specific point in time, but this does not mean that it cannot be data about the user or data entered by the user. Their change can be relatively fast if they have a large volume, so as a model they do not tell about reality as a whole.

In such a case, they speak only about specific, selected characteristics [14]. Information is derived from data. The information must meet several criteria. Above all, they must be comprehensible, relevant, accurate and timely, otherwise they cannot be considered high-quality [15]. To a certain extent, knowledge can be understood as information that the student acquires, stores and can subsequently integrate into the context and context. In essence, information represents only a small part of knowledge, which is less precise than data, but more general, and this part includes the process of abstraction [16]. The information society constantly brings new and new possibilities for the creative approach of people and therefore also teachers in schools. At the same time, it bears the risk of employing sufficiently qualified or unqualified persons. The information society also enables the expansion of access to public information, unfortunately, many times without the possibility of understanding the information within its normative relationships in society [17]. According to David Bawden and Lyn Robinson (2012), it is absolutely common to say that we live in an information society that is bounded by policies in a certain way, especially in terms of governing concepts [18]. For the development of innovations, ICT in schools and information society in its complexity, the connection of information science, law and public policy is important. ICT makes it possible to overcome spatial and temporal limitations given by industrial technologies [19]. Even when using ICT, the teacher must remember the goals of each lesson when preparing for the educational process. In didactics and in the teaching of a specific subject, the formulation of educational goals is simpler than when setting general educational goals. Didactic objectives can be considered more specific as they are based on educational content. Based on the above, the goals of the educational process and teaching as such can be defined as the targeted and expected results of the teaching process, which the teacher is aiming for thanks to cooperation with the students. Defining teaching goals is one of the most important activities for a teacher. Teaching strategies are based on correctly defined goals, and the teacher must return to the goals when evaluating the result of the educational process [20]. The teaching objectives are equally related to the specific educational process, as well as the lesson and the teaching topic. They are a solid point of every teacher's thinking when preparing for teaching. In essence, it is a teacher's idea of how to achieve a change in the cognitive structure, attitudinal qualities and performance parameters of students – in short, what students should master, what they should learn [21]. When achieving the goals of the educational process, choosing an appropriate teaching method is important. The more interesting the method is, the more it arouses the student's interest not only in the subject matter, but also in the subject itself. Teaching methods can be considered primarily as a way to achieve educational goals and, secondarily, as a coordinated system of teacher activities and student learning activities aimed at achieving educational goals set by the teacher and accepted by the student [22]. On the basis of algorithmic learning, the theory of program learning, using the principles of cyber pedagogy, the idea of introducing computers into teaching as an exclusive didactic tool arose. Such teaching includes: simulation programs, modeling, testing programs, multimedia programs, information resources, video conferencing, virtual reality and websites [23]. Currently, teaching with the involvement of ICT is mostly applied in the form of presentation of various teaching programs. Educators have at their disposal various software products, simulation programs, teaching programs, didactic games, programs for practicing the learned material, expert systems and teaching programs using artificial intelligence, electronic textbooks, electronic encyclopedias, etc. However, they do not always know how to work with them correctly. However, the more often a teacher includes work with UKT in the educational process, the more the function of the teacher changes. In that case, the computer replaces activities such as conveying new material, explaining, repeating, checking, and even managing the cognitive process. Thus, the pedagogue moves from the role of mediator to the role of programmer and manager of the cognitive process, to the role of assistant, advisor to the student in the process of learning and learning. It is for these reasons that it is necessary to innovate the methods used by the teacher in teaching, especially from the point of view of responding to the needs of contemporary society. The innovation undoubtedly also consists in the gradual elimination of the teacher's support, in an effort to

support the complete independence of the pupil [24].

### **3. THE WEBSITE AS A MODERNIZING ELEMENT OF TEACHING**

One of the forms of processing printed teaching materials into digital form is a website. Creating a high-quality, engaging website in the 21st century, the century of technical progress and social networks, dynamically responding to the stimuli and needs of society, is probably as difficult as being able to make it visible after its publication and later constantly update it or manage it functionally [25]. Perhaps that is also why its creation was initially narrowly specified for experienced experts, who have the necessary modern material and software equipment. Today, not only viewing information shared on the Internet in various graphic forms, but also publishing it, can become a routine activity for each of us [26]. There is not one, but a large number of different publications devoted to this issue, offering various instructions, methods, topics, with the help of which even a less experienced individual can create such a website, which makes available to its visitors content of a different nature in high graphic editing [27]. However, the degree of their topicality remains questionable, if we take into account the daily increasing new knowledge in the field of science and technology, the constant creation of new programs by programmers, or the rapid development of the Internet. Implementing work with ICT in teaching requires a certain skill on the part of the teacher. However, if he has it, he can design a class that is engaging for the student, inspiring for the colleague and innovative in its complexity [28]. But he also has to take into account that working with a computer, browsing various websites, viewing videos, photos, sharing information, communicating on social networks is something that almost every student can master these days. In fact, something that normally fills more than 50% of his free time. Some of them can even create and run their own YouTube channel, website, blog, etc., most often used to promote themselves or a certain hobby [29]. If the teacher takes all of this into account and is able to offer the student knowledge in the subject that he teaches in a form that the student is practically used to and which is more than close to him, it can be counted on that the rate of their adoption will also be higher [30]. At the same time, by introducing ICT elements into teaching, the educational impact on the student will be greatly improved - unknown knowledge will be presented to the student in a form close to the tools chosen by the teacher, which will enable him to learn it more easily. But their choice must not be a matter of chance. The pedagogue should choose them mainly on the basis of what goal he wants to achieve by involving them in teaching [31]. Not all educators have mastered working with the various available programs, so they cannot even include it in teaching. They often do not even know about ICT elements that they could include in the process of education and training, not to mention that only a few of them are able to create their own ICT tool, which would be functional and helpful to the same extent. At the same time, most schools have the necessary technical equipment for working with them [32]. There are several browsers making available to Internet users a huge number of different themed websites. Therefore, even finding one that could be used in teaching would definitely not be a big problem. Most students would probably appreciate the effort of a teacher who would make the presentation of the curriculum special by manipulating an ICT aid, perhaps even more so if he took the effort to create it himself [33]. Even a person untrained in the field can create a website by using various instructions, but if it is to be a website that will be used when working with students in the educational process, he must not only be proficient in computer manipulation, but also master didactic principles and principles. Therefore, before starting its creation, it is important to thoroughly think everything through, prepare documents, and plan [34].

#### **3.1. Possibilities and Limits of creating A Website for the needs of education**

There are about as many website samples and templates available as there are real websites. The

elements it will contain must be adapted to the content and nature of the entire page. There are several basic ones that serve to better orient visitors, which should be available on every existing and functioning website. If an Internet user opens a page that makes him feel uncertain, confused or lost, he will very quickly leave it and look for another one. Therefore, every web page should offer as clear a user interface as possible and should be easy to handle [35]. The transparency of the page is best ensured by its compiler if the main vertical or horizontal navigation bar directly directs the user to the content he is looking for [36]. The most important thing is the main content of the website, which should be created and finished in such a way that it is in accordance with the purpose and nature of the site. It is logical that the graphic design and quality of individual pages, which are influenced not only by the author's ideas, knowledge, skills, but also by the overall focus of the website, will be different. Behind each page stands a certain person who created it with a specific goal. The target adapted its content, which either became his personal presentation of himself, favourite activity, animal, or anything else in the form of a personal page, or the promotion of his business in the form of a company or e-commerce page. HTML computer code is used to create most web pages. However, there are already websites available on the Internet today that offer the possibility of creating a new website online, so that the creation of pages in the form of HTML is replaced by creation and publication on a web server. In this way, even a person who does not know programming can quickly design his own website, without having to work with graphic editors, HTML and FTP editors. Each user will have access to several patterns, templates, fonts, animations without having to leave the currently viewed page, thanks to which he is able to publish a finished and functional website within a few hours. However, certain limitations in the framework of creation, or the impossibility of completely adapting the website's visuals to the needs and ideas of its creator, can become a problem [37]. It is assumed that most pages will contain at least one text field after their publication, since each author mainly presents his thoughts, ideas, observations to the audience using it. None of the creators create a website randomly, but with a certain goal, that is, they can roughly estimate who will fall into the category of its follower and subscribers. The chosen font style should therefore be easy to read, its size should be adequate. If the text field will be named with a title, it should be highly visible and clearly distinguishable from the rest of the text [38]. Therefore, in addition to flawless grammatical execution, the text should also be adequately adapted in terms of style, size, and colour, primarily to the visual background, but also to the requirements of the visitors [39]. The way it works and the appearance of the web format when resizing in the browser window affect pixels. Their correct configuration can bring web users closer to its content in high resolution even on a small screen, for example a mobile phone or tablet, which will allow working with the web not only on a computer set [40]. If the page lacks blank areas, text fields become very difficult to read because of how much the text is crammed into them [41]. The creator can place several text fields on the website. It is advisable that they be shorter and more concise, separated by headings, subheadings, visual material, videos, or divided into several pages of the same website connected by "next" and "back" buttons [42]. In the same way that it is important that the published content goes through regular updates, it is also important that the appearance of the page goes through it, as the trends in the virtual world are subject to inexorably fast changes. The style that the author of the page decided to use when publishing it will probably be seen as outdated in a few months. It is therefore advisable to change the appearance of the site every six months. It does not have to be radical changes, minimal adjustments are also considered [43].

### **3.2. Digital teaching material in the Form of a website For the Subject of History**

Working with a page that the teacher created himself is difficult in the phase of compiling it before publishing, but from the point of view of the possibility of its constant change, finishing, updating and working with it, it is all the easier, because the teacher, as the compiler, himself influences its form and selects the accessible information [44]. If we focus on a historically oriented page, its nature will always require the creator's ability to connect text fields with various

visual elements, so that the viewer's awareness of the historical fact can be strengthened through direct observation [45]. There are quite a few historically tuned websites available on the Internet. However, the degree of their originality, plausibility, topicality, and truthfulness is different. It is possible to look for pages with a very similar thematic focus, often even identical, but also, on the contrary, very different, since history itself gives researchers a lot of stimuli for its investigation, understanding and interpretation. Each newly created website falling into this category can significantly enrich not only the individual who comes across it while browsing the Internet, but also the student manipulating it under the guidance of a teacher in the process of education and training [46]. As a concrete example of transformed print content related to regional history within the history subject, a website available from 4/27/2022 at the following link: <https://odievanie-webjet-sk.webnode.sk/> from the author of the study can be cited. Since its first publication, it has been edited and supplemented several times. Even in the future, it cannot be ruled out that it will be updated, supplemented with content, or edited in cooperation with other educators dealing with the given issue. Each part of it and the overall content focus is adapted to the level of cognitive processes of a primary school student. The individual sections seamlessly follow each other and area transformation of knowledge about Princess Oldenburg's clothing from print materials of an archival and book nature.



Figure1. Introduction section.

INTRODUCTIONSECTION – presents the created web site to the visitor. This section contains basic instructions that must be respected when working with the site individually and within the classroom. In the event that an individual who is interested in its content has visited the page, he can move around it at will. However, if a teacher includes some part of the page in his own lesson, he should think carefully about the purpose of this activity, so that he can choose a specific part of the page appropriately. A smooth transition between sections is made possible by the sidebar offering: Introduction, Be sure to study this, You must at least look here, It won't hurt you to think, And here you can learn something more, Contact.



Figure2. Information symbols.

In the introduction section, there is also a warning about two basic symbols that the visitor of the site will definitely encounter if he works with it. This is an "information" symbol, drawing attention to the teaching text, and a "smiley" symbol, drawing attention to the possibility of implementing a project, task, or answering a question.

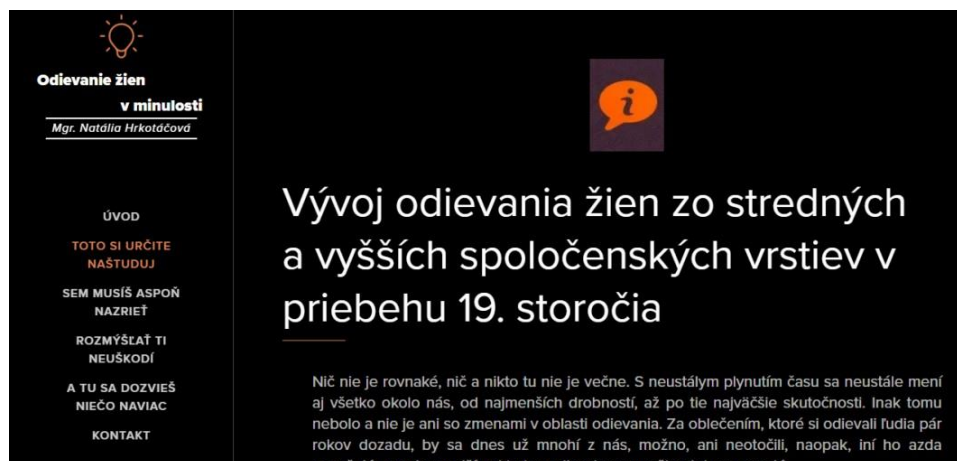


Figure3. Section Be sure to study this.

BE SURE TO STUDY THIS SECTION – offers the visitor a brief overview of the development of women's clothing from the middle and upper social classes during the 19th century. The primary task of this text is to attract attention to such an extent that the site visitor, a student in a school environment, acquires the desire to work with the site and get to know its entire content. By scrolling to the very end of this section, the viewer will be prompted to study something from the section It Won't Hurt You to Think. It can be accessed by simply clicking on the link highlighted in orange directly in the text. Under this link there is also a list of the most recently added articles, usually three. It is possible to choose one of them and click on it.

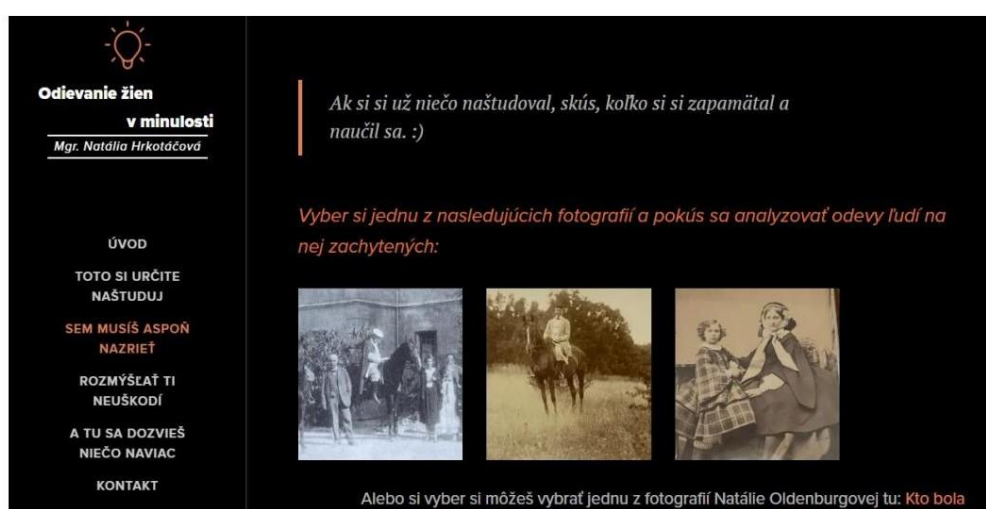


Figure4. Section You have to at least look here

THE SECTION YOU HAVE TO AT LEAST LOOK HERE – is a section offering additional tasks and assignments to the studied material. In this section, it is possible to analyze the offered photos, develop a project according to the assignment, come up with the name of your

own project, or even develop a short online test.



Figure5. Section It won't hurt you to think

THE THINKING SECTION WILL NOT HARM YOU - concentrates all didactic material that can be used in real pedagogical practice. In the individual articles of this section, topics are prepared that can be directly implied in the history lesson. The teacher must carefully study the articles before engaging in teaching. Some of them also offer a directional button. After clicking on it, the site visitor will be redirected to another section. In some cases, multiple directional buttons are offered. In that case, it will depend on the individual preferences of the viewer which one he chooses. The analysis of Natalia Oldenburgova's clothes, elaborated in this work, is contained in the article titled Analyzing Natalia Oldenburgova's photographs.



Figure6. Section A here you will earn something more.

SECTION AND HERE YOU WILL EARN SOMETHING MORE—offers a list of Recommended books related to the given issue, for the possibility, in case of interest, of studying the necessary information in detail.



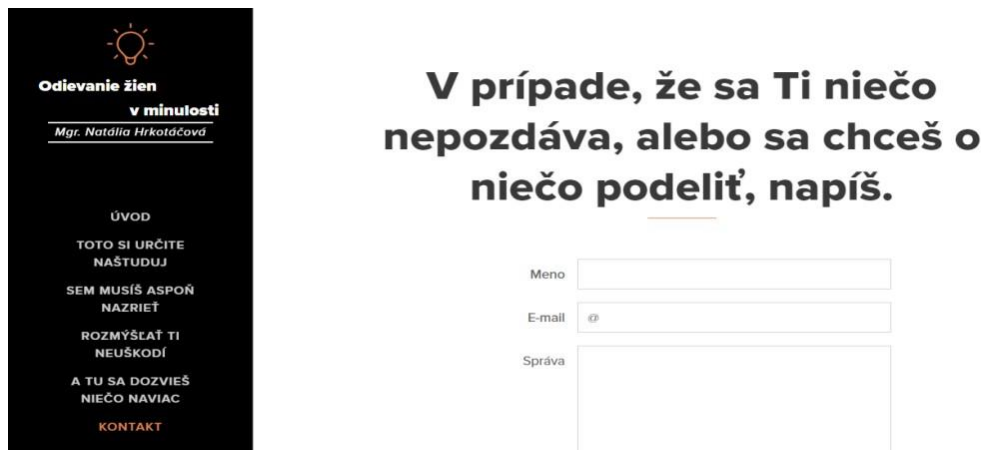


Figure 7. Contact section.

CONTACT SECTION – the expected future update of the site also requires feedback from its visitors, especially for possible elimination of its shortcomings. At the same time, this section makes available the possibility of easy contact for web viewers who would like to know and contribute to its editing or addition.

#### 4. INCREASING THE DIGITAL SKILLS OF TEACHING STUDENTS WITHIN THEIR UNDERGRADUATE TRAINING

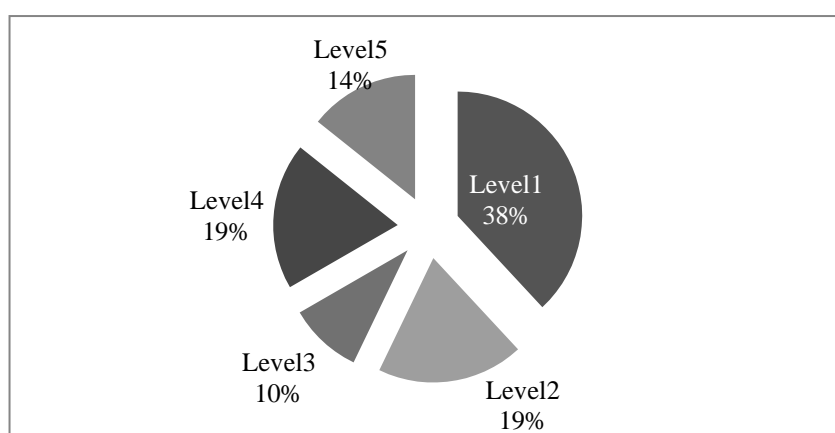
The continuous introduction of the most modern information and communication technologies into individual areas of education, especially into the process of upbringing and education, the training of teachers for the possibility of their active implementation in the teaching process, the creation of e-learning content, can be considered as one of the key factors in increasing the level of education in the Slovak Republic. Since we call today's society "information", based on the basic aspects of the civilized literacy of today's individual, one of the goals of a modern school can undoubtedly be considered to be the effort to teach a student teacher, as part of his undergraduate training, to effectively use and manipulate information and communication technologies in his future active practice. Among other things, it is also possible in this way to make the process of training a student teacher more efficient, who as a result should be able to use ICT effectively not only for their own study and preparation, but also in the daily learning process and the performance of the profession itself [47]. Students of teaching professions should be trained in several areas as part of their undergraduate training: moral, ethical, human qualities of personality, professional competence. An irreplaceable role in the whole process is played by the personality of the educator, who is expected not only to have a high professional level, but also to be able to respond to the constantly changing and constantly developing process of the permanent search for knowledge. In the whole process, the educator's personality is also important, as he is forced to accept and subsequently reflect changes in the content of study programs [48]. Certain skills, abilities, habits, i.e. competences acquired in the process of preparation for the teaching profession, also understood as a necessary prerequisite for handling various situations in the performance of the profession, need to be developed in educational practice. In it, the pedagogue should appear not only as one who plans, knows, organizes, determines, manages, decides, evaluates, but also as an inspiring, stimulating, helping, facilitating individual, creating suitable conditions for the overall development and cultivation of the student's personality [49]. According to Kasáčová, the undergraduate training taking place at the university level should be oriented towards the development of competencies in

Three basic dimensions :a)personnel; b)professional; c)ethical. It is implemented on two levels: theoretical and practical. Theoretical training focuses on the acquisition and development of abilities, skills, and knowledge in the field of pedagogical, psychological and professional disciplines [50]. Practical, i.e. professional training, has the character of a residential or exit internship, which is mandatory to complete in order to complete the studies, to thoroughly prepare the student for inclusion in the educational reality [51]. As a result, the profile of the graduate should be a combination of personal and professional qualities of a teacher in the development phase of his professional maturation. Educators are automatically expected to incorporate the latest technologies, or to design and implement teaching strategies leading to the most effective learning possible for everyone, even for specific individuals. It is technologies that bring with them, including positives that facilitate functioning in the "age of digitization", both threats and challenges [52]. The undergraduate training of teacher students is carried out at the University of Constantine the Philosopher in Nitra through the study fields: Preschool and elementary pedagogy and Teaching for primary education. In the academic year 2023/2024, we incorporated work with ICT into the content of the subjects: Creation of teaching materials for teaching the Slovak language and literature and Basic grammar skills. In addition to working with printed forms of teaching materials, students had the opportunity to become familiar with digital platforms, methods of transforming printed content into digital form, limits and creation of their own platforms and websites. In an effort to determine the impact of such a teaching method on the digital competences of the students of the mentioned programs within the seminar groups, we carried out a measurement and comparison of input and output information and data literacy using the Euro pass measurement tool. The basic starting point was a thorough, well-thought-out, targeted selection of the sample set. It did not seem appropriate to make a random selection of individual students and also to "distribute" complete study groups for research purposes. Adequacy of the research sample was ensured by prioritizing the selection of compact groups of students - specific study groups, corresponding to the selection criteria: identical field of study, identical degree and semester of study, identical subject. The research sample was a combination of 77 students of the 1st year of the master's study program Teaching for Primary Education, with students of the 2nd year of the bachelor's study program Preschool and elementary pedagogy. Thanks to the euro pass research tool - an online test created by the European Union for the possibility of verifying the level of digital competences, it was possible to define digital competences for each student in 6 levels (level 1-6) and in five categories: Information and data literacy; Communication and collaboration; Creation of digital content; Troubleshooting; Security. After the development of 10 basic closed items by a specific student, from the area of all five categories, the system generated the necessary number of additional closed items, for the possibility of evaluating all five categories and defining the resulting level of the student's digital competences in each category separately and then in total. By evaluating all items, the system automatically assigned a level to the student's abilities in individual categories and comprehensively. Entrance testing of individual seminar groups of students took place at the beginning of the summer semester of the academic year 2023/2024. In all categories, students covered lower levels and showed poor results. They also achieved a particularly low entry level in the category Creation of digital content. Next, we present as an illustration the input data of the seminar group in the number of 21 students in the mentioned component.

Table1.Input data of seminar group no.1 in the Digital Content Creation component.

Levels	Absolute frequency	Relative frequency	Relative frequency in%
Level1	8	0,38	38,10
Level2	4	0,19	19,05
Level3	2	0,10	9,52
Level4	4	0,19	19,05
Level5	3	0,14	14,29
Level6	0	0	0
In all	21	1	100

Graph1.Input data of seminar group no.1 in the Digital Content Creation component.



## 5. CONCLUSIONS

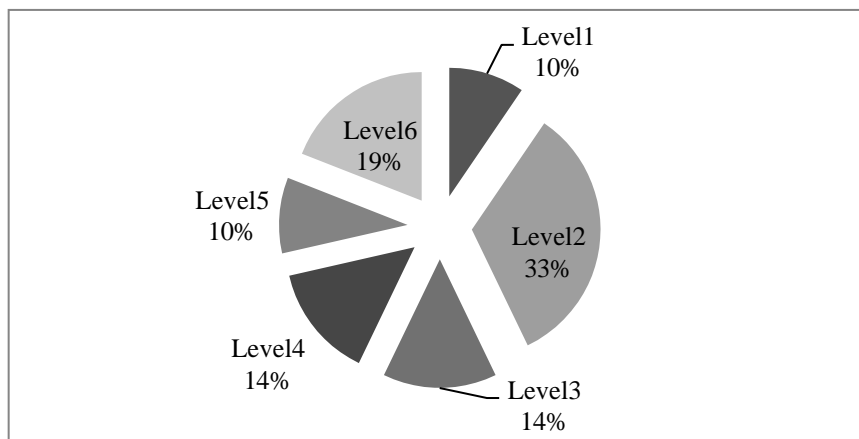
Modernization of the educational process is currently a necessity, especially in connection with the implementation of the reform of the content and form of education. As part of the concept "Education for the 21st century" in the Slovak Republic, in the field of education, emphasis is placed not only on education in cycles, connecting individual subjects, strengthening inter-subject relationships, butal soon increasing the level of information and data literacy of students and teachers. Modernization undoubtedly lies in the complexity of innovation in the content of education, methods, forms of educational work of the teacher and the school, the material and technical side of teaching, and therefore the manipulation of digital forms of teaching materials can clearly be considered as its form. Despite the large number of them available, the teacher also has the possibility of their own conception and subsequent creation. For this, however, it is necessary for him to know the principles of assembly and master the technique of creation. Adoption should occur in the process of undergraduate training. With an emphasis on teaching in the 21st century, the effort is to encourage not only students in their undergraduate training, but also current teachers to use digital teaching materials and digital textbooks when teaching at individual types of schools [53]. Information and communication technologies have gone through a process of great development since their inception. The 20th century can be considered the period of perhaps the greatest boom. In his 80s and 90s, it was precisely computers that caused the biggest breakthrough in the new understanding of society as an information society. Technology is improving day by day and new innovations are constantly appearing. Under the influence of the changes at the end of the last millennium, the Slovak Republic became completely open to global influences and civilizational trends with the subsequent rapid

development of the informatization of society [54]. Undoubtedly, educators must also be prepared to handle technology in practice. It is therefore essential that they have skills and abilities in the field of incorporating and working with ICT in teaching. In an effort to increase the low entry level of students in terms of their digital literacy, the content of the courses Creation of teaching materials for teaching the Slovak language and literature and Basic grammar skills during the semester was supplemented, in addition to printed forms of teaching materials, with manipulation of digital forms of teaching materials, work with digital content, mastering the creation of digital content using various platforms and programs. The selection of teaching material and the training of teaching methods was subject to data analysis, on the basis of which components were included in the seminar lessons of the tested groups of students, the application of which should be able to increase the level of output data comprehensively and in individual categories. In order to verify the efficiency of the process, we also implemented output testing. The entire research sample as part of the exit testing, which was carried out on May 7, 2024, consisted of an identical group of 77 students, just like in the entrance testing. Next, we present the output data in the Digital Content Creation component of the same seminar group as in the entrance testing data, in the same number – 21 students.

Table2. Output data of seminar group no. 1 in the Digital Content Creation component.

Levels	Absolute frequency	Relative frequency	Relative frequency in %
Level1	2	0,10	9,52
Level2	7	0,33	33,33
Level3	3	0,14	14,29
Level4	3	0,14	14,29
Level5	2	0,10	9,52
Level6	4	0,19	19,05
In all	21	1	100

Graph2. Output data of seminar group no. 1 in the Digital Content Creation component.



The output data from the point of view of the acquired level of digital competences showed a significantly higher level of information and data literacy of students overall and in individual components. Output testing took place in an unchanged manner, using the same Euro pass research tool. It is clear from the acquired data that the incorporation and adoption of work with digital teaching materials was able to increase the level of digital competences of teacher students and thus make their undergraduate training more efficient. The ability to manipulate

ICT components in the educational process can be considered one of the basic pillars of education. It is therefore necessary to educate students in this area as part of their undergraduate training.

## **THE STUDY SUPPORTS THE INTENTION OF THE UG A PROJECT WITH REGISTRATION NUMBER V/6/2024.**

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