STUDENTS` ACTIVITIES
IN THE DIGITAL ENVIRONMENT

Dr. Tatiana Shopova, Assoc. Prof.
South-West University "Neofit Rilski" – Blagoevgrad

Abstract. This paper aims to highlight the key role of the information and communication technologies (ICT) in the activities of Bulgarian students, and to establish the mastery of their digital literacy skills. In its empirical part, the study turns to some areas of digital competence of students such as application of knowledge, skills and attitudes. The survey was conducted among 100 students during 2014 – 2015 by the method of direct individual survey through pre-designed questionnaire comprising of 40 questions. The data of the survey were analyzed using statistical methods - frequency, mean value and confidence level – 95%. The importance of the current research is not only in a theoretical, but also in a practical-application plane, aiming to highlight the crucial role of the digital literacy for students to adapt to the dynamic labour market and the need of outlining a d igital library as a significant mediator in the university educational environment.

Keywords: ICT; digitally literate student; university students` activities; digital library

Introduction

Nowadays, the widespread use of the new information technologies influences all aspects of everyday life, increasing the changes to the structure of working activities and the ability to master and use them. There is increasing importance for professional self-realization, improving the quality of life, creativity and self-actualisation through education, community collaboration and critical activity[1] (Pötzsch 2019; Shutenko et al. 2018). The priorities of the adopted Digital Education Action Plan (2021 – 2027) are identified as `Fostering the development of a high-performing digital education ecosystem` and `Enhancing digital skills and competences for the digital transformation`[1]. Adapting to the digital economy and society of the 21st century implies emphasis on digital literacy skills and competences to live, work, learn and thrive in the rapidly changing and increasingly digital world. Without individuals who are not trained to intelligently face up to the challenges of using digital technologies, our society will not be able to grow economically; there we cannot expect any democratic and socio-cultural development.

The impact of the new technologies in education is increasingly becoming a powerful tool for changing many of the educational practices, an indispensable source for learning and constructing the intellectual creative potential of every person (Henriksen, Mishra & Fisser 2016; Henriksen et al. 2018; Loureiro & Messias 2016; Pozos & Fernández 2018, etc.). In addition to cheap, accessible, diverse, and dispersed forms of knowledge distribution, the effective participation in the network environment requires expanding the focus on critical digital literacy, which is a prerequisite for living in a digital world. This new literacy implies the acquisition of skills and attitudes not only for searching, retrieving, analyzing, evaluating, critically interpreting, responsibly using information and creative content production, but also abilities for civic activity and democratic participation (Castellví et al. 2020; Frau-Meigs et al. 2017, Pozos & Fernández 2018; Pötzsch 2019). According to Castellví et al. (2020) critical digital literacy `is not only about developing technology or critical thinking skills but is a preparation for living in a digital world`, which implies acting `socially on the pursuit of radical democracy and global justice`.

Researchers are facing the issue of determining what the attitude of young people today is towards the use of the information and communication technologies, how are they changing their daily lives, their values and perceptions, ways of learning and lifestyle in the new digital environment. This is why the present study in this paper aims to answer some of these questions by focusing on one of the most active web users - students. This new generation called `digital` has grown up with modern technologies more than any other generation before. They reflect not only on leisure and recreational activities of students, but also on the processes of education and training, in which they are involved in, on the acquisition of those skills and knowledge needed for living and working in the digital society.

The development of digital literacy among students is crucial for improving the efficiency and effectiveness of the learning process, as well as for adapting students to the ever-growing demands of the global and dynamically developing labor market. The integration of information and communication technology in the processes of learning presupposes active acquisition of a complex (set) of abilities and skills such as `reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge`, which are needed to build the new `meta-literacy`[2]. In the new digital environment it becomes necessary for students to be not only consumers, but also creators of knowledge, showing creativity, an openness to new points of view and a critical attitude.

The contemporary digital literacy studies accentuate the need of getting beyond the basic skills of using the digital tools and information resources and developing strategies for a critical and efficient use of these means (Fraillon et al. 2019; Flores-Lueg & Roig-Vila 2019; Garzon-Artacho et al. 2021; Gisbert Cervera

et al. 2016; Law et al. 2018; Nguyen & Habók 2020). Researchers note the need to build a conglomerate of knowledge, skills and attitudes to use information and communication technology for living and working in the digital era. Law et al. (2018) outline global framework that consists of several areas of digital literacy competence such as searching, evaluating, managing, communicating, integrating, creating digital content safely and appropriately through digital technologies for participation in economic and social life.

It is needed for the digital literate person to have ability to participate actively in computer-mediated communications for work and collaboration, for learning and research. It is especially important for him to develop operational skills (the ability to manage and operate ICTs), information navigation skills (the ability to find, select and critically evaluate digital sources of information), social skills (ability to use online communication and interactions) and creative skills (the ability to create (quality) digital content to be published or shared with others) (Helsper et al. 2021; van Deursen et al. 2017).

In her initiated studies Shopova (2014, 2019) identified some gaps in the process of acquiring the digital skills and abilities to learn with ICT`s. It was found that the majority of students (especially in humanities and social sciences) did not know or use the resources located in the university e-library catalogue; fewer were those who had the skills to critically evaluate information and use it creatively.

Other studies in this area are examining the role of the digital searches of students and the frequency of library use and its resources, including the scientific research databases (Owusu-Ansa et al. 2018). Others established correlation between library and electronic recourse usage and successful performance of students[2]) (Jabeen et al. 2017; Raju 2017; Thorpe et al. 2016).

The current paper focuses on the role of digital competence in everyday activities of students. It includes an analysis of the extent of effective use of the ICT`s, including: formal skills for navigating the Internet; communication skills in digital environment; ability for creative expression on the Web; specific skills for collecting and processing needed information; competence in safe and secure online behavior, and following legal and ethical principles in using ICT and digital information.

The aim of the study was to understand the degree of mastery of internet and information literacy skills of students, which were suggested to establish: 1) The level of absorption of the required skills for working on the Web mainly connected with using browsers and hyperlinks; 2) The level of using various online resources and functions that is important for their daily activities, and the students` attitude to creativity on the Internet; 3) The degree of understanding and effective use of computer-mediated communication in their daily activities; 4) The students` abilities to search for, find, retrieve and critically evaluate of information obtained from various internet sources; 5) The degree of recognition of issues related to

the legality and reliability of information, as well as legal and ethical principles in using the digital sources.

Materials and Methods

In its empirical part, the study turns to some areas of digital competence of students as application of knowledge, skills and attitudes to achieve certain aims. More specifically, the ability of students to integrate ICT`s in their daily lives for creative expression, communication and learning in a responsible and critical way using the full capacity of new technologies. The survey was conducted by the Center for New Media and Digital Culture at the South-West University during the 2014 – 2015 academic year.

The survey was realized by the method of direct individual survey through pre-designed questionnaire comprising 40 questions that the respondents had to fill in (electronically or on paper). An electronic questionnaire was created using Google Forms and distributed among students selected on a random basis. In accordance with the intended objective, a survey was conducted, which is based on a questionnaire structured into sixth sets of questions aimed to determine: The first set of questions was designed to ascertain the access of students to the network and their ability to work in it: Frequency of usage, time spent and main location of using the Internet; Preferred devices to access the Internet; most used Internet services. The second set of questions was about the students' preference for using different forms of entertainment on the Internet: videos, movies, music, reading popular literature, video games, listening to radio and watching television, lifestyle, and sports. The third set of questions aimed to understand the communication skills of students in the online environment: Looking for advice from various people on using the Web; Constructing profiles and identities on different social networks. The fourth group of questions was aimed at understanding the students` attitudes towards participating creatively in the Web, actively using blogs, forums, websites, etc. as a field for expression of personal opinions and comments or creating and publishing own content. The fifth set of questions concerned the capabilities of students to learn effectively through using the new technology in the digital environment. For them it is important not just to transmit facts and knowledge, but to formulate and acquire significant skills and abilities to successfully meet their research, to choose the sources of information and build new knowledge.

The survey was conducted among 100 randomly selected students, 67% of the whom were women and 33% were men, from four universities in Bulgaria: South-West University "Neofit Rilski"- Blagoevgrad, Sofia University "St. Kliment Ohridski", Technical University-Sofia and University of National and World Economy. Surveyed students were studying mainly in Humanities Sciences – 67%, and the remaining 33% in Technical Sciences (7%), Computer Sciences (7%), Social, Economic and Legal Sciences (7%), Public Communication and

Information Sciences (6%), and Mathematics and Natural Sciences (6%). 78.26% of the respondents were 18 – 23 years old.

The statistical apparatus includes statistical methods - frequency, mean value and confidence level – 95%.

In the survey were made the follow tentative assumptions: First, today's students possess different digital skills such as the technical skills for navigating the Internet, information skills for finding, interpreting and evaluating information retrieved from different types of information sources to perform their everyday activities, and communication skills, which have become increasingly important given the expanding prominence of the social web (van Deursen & Mossberger 2018). But most students have not yet mastered the ability to express themselves creatively in the Web such as creating and publishing their own content or maintaining own website or blog. Second, students still do not have needed skills for using the rich resources of the electronic library, which hinders their better performance and achieving better learning outcomes.

Results

1. To understand the access of students to the network and their ability to work in respondents had to answer to some questions. To the question can they name the browsers the study indicated that 54.55% of the respondents were able to correctly name browsers and 45.45% – operating systems. However, there were students who identified the following as names of browsers: Google (7.35%), Yahoo (1.74%) and Word (0.58%), which showed (even partially) the lack of awareness of some students to work on the computer and use the Web. To the question how often they use the Internet, 81.7% of respondents said they had daily access to the Web, 13.98% answered "almost every day" and 4.3% – "1 – 3 times per week".

The question "Which internet services do you prefer to use?" had to understand the most preferred Internet services among students. According to the data the respondents chose e-mail as the most popular Internet service (22.08%), followed by Skype or another program for video telephony (18.27%), interactive maps (12.69%) and search/job application (11.93%). Fewer students reported that they tended to use e-shopping and e-commerce (10.66%), transport services (9.64%), travel services (6.85%), e-banking (4.57%) and administrative services (3.30%).

In Figure 1 was showed the mean value was 10.90% at a frequency of 87 to 13; the standard deviation was 5.51%, and CL-95% – 3.60%.

2. Today`s young people are spending much of their leisure time in consumption of numerous services on the Web. Therefore, it was interesting to see the next set of questions related to the preferences of students to use different forms of entertainment on the Internet. The survey data showed that the majority of the respondents chose to watch videos on YouTube, VBox7 etc. (18.02%), movies (17.15%) or listen to music (16.86%). Those who spent time listening to radio and
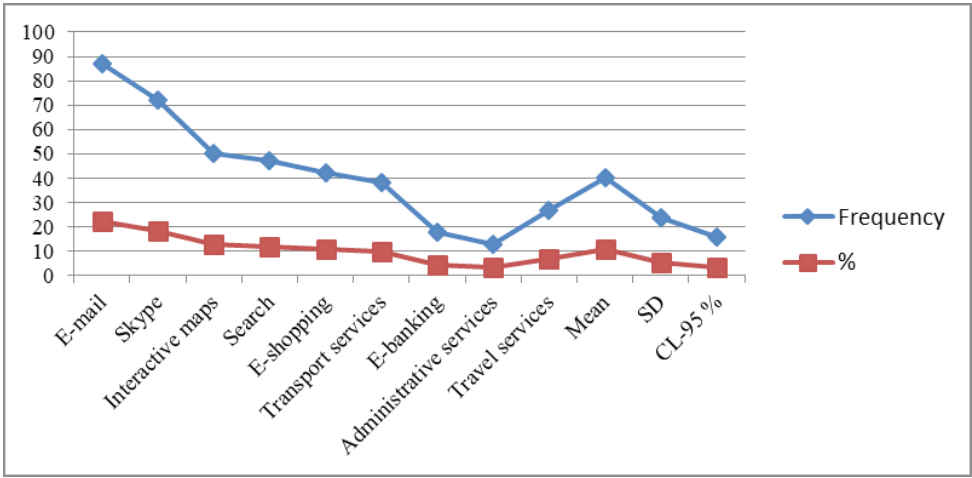
Figure 1. Most preferred internet services

watching TV on the Web were 14.53%, reading of popular literature (11.63%), Lifestyle – hobbies and leisure (7.27%), Lifestyle- sports, health (6.69%), video games (4.36%) and sports (3.49%) were less preferred sources of entertainment. It can describe the following linear equation $R^2 = 1$ in Figure 2.
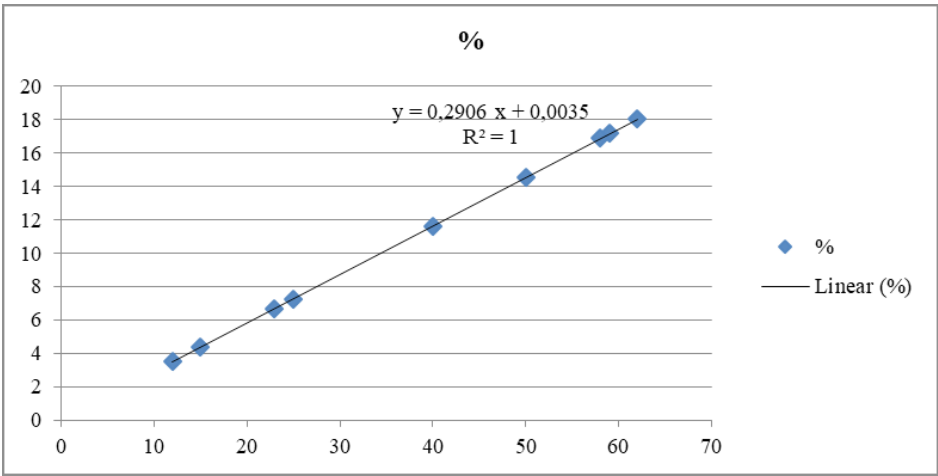

Figure 2. Linear equation of using leisure services on the Web

In Figure 3 was showed the mean value was 10.9% at a frequency of 62 to 12; the standard deviation was 5.13%, and CL-95% – 3.35%.
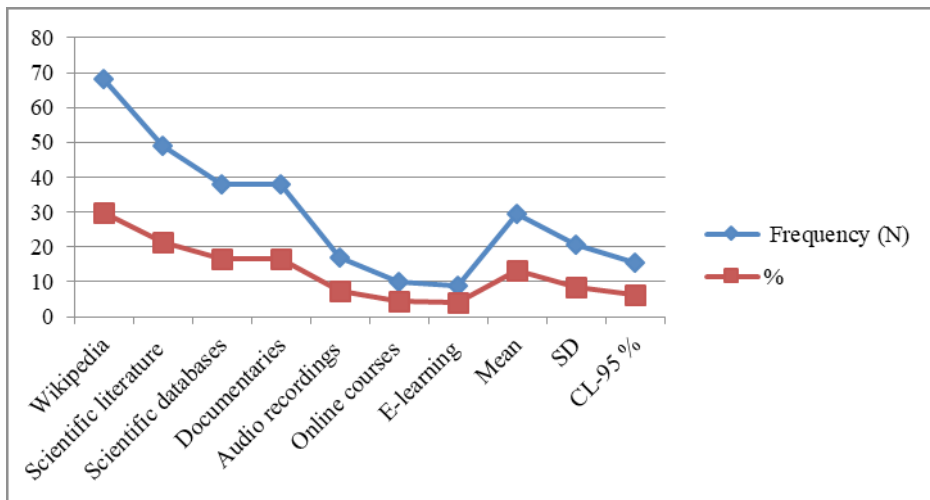
Figure 3. Using leisure services on the Web

3. To understand how students communicate in online environment, there was a need to ask them: `When they need advice on the use of the Web, is there someone they can turn to? ` The data found that the majority of students preferred to communicate with friends (68%) and a lot less – with family members/ close relatives (18%) or lecturers (5%). Very few respondents indicated Library employees (4%) and colleagues (2%). 3 % indicated that they had no one to turn.

A large number of students chose social networks as a preferred communication tool. Facebook was the favourite network (52.73%), followed by Google+ (27.27%). Twitter (9.09%), LinkedIn (4.85%), MySpace (3.64%), Pinterest and Flickr (each 1.21%) remain at lower positions.

4. It was interesting for the survey team to find out whether students participated creatively on the Internet or not. According to the survey data many respondents were indifferent to the blogging as a field for the expression of their own ideas and views. Only 9.78% shared that they use blogs, forums to create and publish own content and 50% answered – "sometimes", and 40.22% – "no". It appeared that students preferred to publish photos (40.97%) that are probably related to the widespread use of social networking sites as a favourite way of online communication. Fewer students created and published their own web content – e.g., different texts as course works, essays, etc. (22.92%), video clips (13.89%), maintaining a blog or website (10.42%), music (7.64%), translations (3.47%) or texts for Wikipedia, etc. (0.69%).

5. It was also important to know the extent to which students learn effectively through using new technology. To the question what sources or forms of education and training they use on the Internet, respondents indicated firstly "Wikipedia" –

29.69%, secondly – "Read/ download scientific literature (journals, books, websites, etc.)" – 21.40% and thirdly – "Scientific databases" and "Documentaries" – 16.59% each). Few respondents chose to use regularly audio recordings – 7.42 %, online courses (language, professional, etc.) – 4.37% and e-learning (web-based training, webinars, etc.) – 3.93 %. In Figure 4 is presented that the mean value was 13.37% at a frequency of 68 to 9; the standard deviation was 8.64%, and CL-95% – 6.40%.
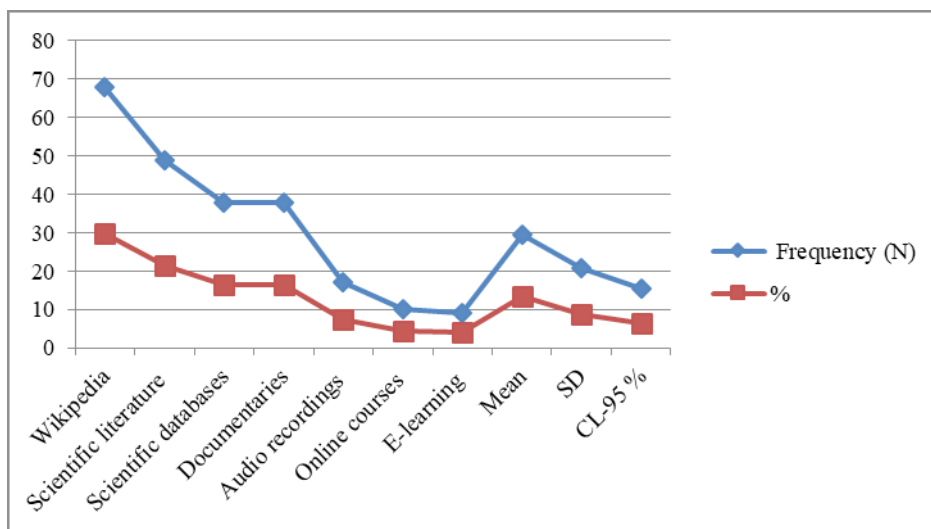

Figure 4. Use of various sources and forms of education

It appeared that most students surveyed used both print and electronic resources (63.0%) in the learning process. 67.39% of respondents said that they regularly used print resources for their learning – textbooks, newspapers, magazines, books, encyclopaedias, maps, documents, etc., 27.17% – "sometimes' and 5.43% – "no". 69.39% chose to use electronic resources, 25.51% – "sometimes" and 5.10% – "no".

They showed a preference for online video (26.60%) when using the e-resources. Few students responded they often used electronic audio recordings (19.21%), online catalogues (17.62%), electronic libraries (17.10%), online photo galleries (16.58%) and virtual museums (5.70%). It is notable that most of the respondents didn`t have skills to use the electronic library resources in their universities. Only 17.10% said that they regularly used e-library on the campuses, 23.83% – "sometimes" and 12.88 % – "no".

Concerning the students' skills to effectively find and use the needed information for solving individual assignments, the study found a permanent trend that had emerged in recent years, namely that most students tended to positively evaluate their

abilities to search for information (78.26%), to analyse and synthesize (80.21%), to interpret and present the found information (74.74%), and many respondents knew to check the objectivity, reliability, accuracy of information from the Web (62.24%). But they had difficulties in its critical assessment and responsible use. Nearly half of the respondents shared that they were able to compare information obtained from different sources (53.61%), knew how to combine the received information with their own ideas and experiment to create new information (56.70%). Only 42.42% of the students surveyed indicated that they were able to critically examine the sources and information, and evaluate it based on specific criteria. A large percentage of the respondents (70%) said that they knew how to recognize plagiarism and avoid it, but a considerable part of them only sometimes or never complied with copyright law and its ethical use (49%). 41% of students only sometimes followed laws, regulations and labels related to the access and use of the Web information resources, while 14% did not.

Discussion and Conclusion

The study confirmed that students have greatly taken advantage of using the digital technologies in their daily activities and in the learning process, regarding the use of various web resources and services. According to the received data the students have basic skills and knowledge to work in the network, and 81.7% of them reported that they have daily access. They participate actively in the field of computer-mediated communications and enjoy the benefits of social networks to connect with others, share social interests and preferences, friendship, etc. Concerning their communicative skills, it was found that most students prefer Internet services such as e-mail and chats (Skype) and among the social networks most actively used was Facebook. A large percentage of the respondents are looking for advice on using the internet primarily by their friends.

The survey identified gaps and shortcomings in the ability of students to demonstrate creativity on the web without utilizing the opportunities of suitable sites and blogs or creating and sharing their own web content. Most of the respondents admit that they have not created and published their own texts (e.g. course works, essays, etc.), video or music for the Web, and have never maintained own blog or website.

The data obtained confirmed the hypothesis that students regularly use electronic resources – textbooks, newspapers, journals, books, encyclopaedias, maps, documents, etc. in the learning process. Students are facilitated in their daily scientific searches and elaborations by the electronic publication advantages of the required information and they regularly use both print and electronic resources, indicating a positive change in the attitude towards information resources compared to the past studies. But students have not yet acquired the skills to take advantage of the e-library and its rich recourses. Moreover, they only occasionally or never use the electronic library resources in their universities. Most of them tend to use

various sources and forms of education; however, they note that they primarily use Wikipedia (29.69%) and much less - scientific databases (16.59%). Thus, it was confirmed the second hypothesis of insufficient mastery of digital information literacy of students, most of whom do not know well enough the electronic resources of the university library; they still do not have the skills and habits to use various academic search engines and the abundance of academic databases in their scientific studies. There is also a trend established in the preceding studies that many students have difficulty to evaluate critically the found information and to use it effectively in solving scientific problems, case studies, etc.

The study underlines how important it is to improve the digital competences of students as one of the main prerequisites for personal fulfilment and professional development in the contemporary society. This will allow students to learn more effectively by using the scientific related resources from the Internet and to be more cooperative and self-directed learners, who are aware of their educational needs and have a responsible attitude to the process of their own learning (Bosch 2019)

According to scientists (Iordache, Mariën & Baelden 2017; Magni, Orlando & Giudice 2020) the building of a new literacy requires developing a set of important skills necessary to orientate learners in the variety of information channels and resources; to make them feel confident about the authenticity, reliability and accuracy of the information obtained, and to gain better control over their own learning. It is not enough to be aware of the computers and work with different sources of information in the new digital environment. It is particularly important to be able to understand, critically evaluate, communicate and create digital content to achieve personal and professional goals. For their research needs, the learners exhibit mental flexibility and creativity, providing new practices and formats of education, result in a change in the education policy and certain functions of teaching staff, students, librarians and managers as main stakeholders in these processes.

The importance of the University Library with its rich information resources comes forward in the educational environment to support and facilitate the research of students in building a strategy for information searching, in acquiring criteria for finding and analysing the results, for selection and evaluation of the electronic resources. There is a need for expert librarians to offer information literacy services through self-directed learning and successful collaboration with teachers in organized courses, workshops and training sessions (Ferri 2021; Kammer et al. 2021). It is necessary for librarians to closely link `learning goals to lifelong learning, with critical thinking and various information literacy skills` (Ferri 2021, 23 – 24). The libraries can facilitate students' digital literacy by supporting education, learning and skills through services and activities adapted to digital reality (Gómez-Hernández 2017). The library staff can offer information literacy programs for acquiring skills on how to use the library and its information educational resources. The role of information library consultant is growing as far as he should support students in

seeking, finding and evaluating relevant information, increases. Librarians can assist students` learning by using information seeking electronic machines (e.g. Google Scholar, Scopus, EBSCO, ProQuest, OCLC, etc.), databases in various branches of knowledge, a variety of e-resources.

And here is the role of our universities that should pay more attention to the development of information literacy skills of students that will have an increasing importance for inclusion into the European Higher Education Area. An important initiative for achieving that goal is the digitization of the university library resources in a portal that can provide easy access to scientific information for all students and lecturers at the University. For instance, the University Library at South-West University is ready to build a digital scientific collection (theses, dissertations, scholar works, etc.), which will enable access to digital information as an indispensable resource. This would help to create an archive of the scientific output of the university that will facilitate students in their learning and research activities. So, the Library will contribute to the radical change and modernization of the academic and technological university environment, combining the traditional and electronic forms of the library services (incl. remote access to full-text electronic databases on the most important scientific fields represented at the University), and turning the University into "e-University". The building of digital library collections will be an important part of the academic community, providing an opportunity to set new standards in research and lifelong learning.

By outlining effective approaches to develop the digital literacy of students and their motivation for using digital information and new tools to work in the information environment, the European priorities in the field of digital technologies and future education will be met. For this purpose, it is necessary to focus on building digital collections as a resource in the University library and its modernization with new technological applications to work online.

Our universities have to adopt relevant approaches and measures for supporting and encouraging the Bulgarian students, especially those in the humanities, to develop their information literacy skills. This is related with the task of providing educational information resources, a database of scientific output created by students and teachers at the University. And here it is necessary to point out the need to adopt comprehensive strategies from our universities that can accelerate the process of motivating and supporting students to develop and improve their academic skills and competencies through effective use of the Library's digital resources and collections.

The importance of the current research is not only in a theoretical, but also in a practical-application plane, aiming to highlight the crucial role of digital literacy for students to adapt to the dynamic labour market; it casts light on the issues of students` information literacy skills, which are related to the need of outlining digital library as a significant mediator in the university educational environment. It is

necessary to point out the importance of the study's empirical component to indicate the approaches to improving the skills of students to use digital technologies in the learning process, which are important for personal fulfilment and development, active citizenship, social inclusion and employment in knowledge-based society.

NOTES

1. European Commission 2020. A second key aspect of digital education is the need to equip all learners with digital competences (knowledge, skills and attitudes) to live, work, learn and thrive in a world increasingly mediated by digital technologies. Digital Education Action Plan 2021 – 2027 Resetting education and training for the digital age COM/2020/624 final, Brussels [viewed 6.12.2021].

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✉ **Dr. Tatiana Shopova, Assoc. Prof.**
Researcher ID: F-6766-2014
Faculty of Arts
South-West University „Neofit Rilski"
Blagoevgrad, Bulgaria
E-mail: tansha@swu.bg