

Digital Technological Solutions in Knowledge Transfer in Higher Education

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Abstract: In a world of constant change and ongoing technological globalization, the challenges facing education are multidimensional. The modern generation of the academic community, especially technical universities, is increasingly demanding in terms of teaching materials: they expect dynamism, a digital approach and very good visual quality. The knowledge provided to them should be presented in an engaging way and using the latest technologies. The world in which society functions, especially young people, is described as a nanosecond culture, i.e. one in which everything is expected to be available immediately. Education has been digitized. Remote learning forced a change in the way knowledge was transferred. Classes and the method of transmitting knowledge should be adjusted to current requirements and the surrounding reality, which will be attractive, immersive and motivating for further learning for students. Traditional ways of education are no longer sufficient to meet society's complex expectations as people often change careers, seek new educational opportunities, and have difficulty coping with life, work, and competing for educational demands. The article is an attempt to answer the question: what digital methods and tools are used by students in the process of acquiring knowledge. Which of them are the most effective? The CAWI method was used for research. The respondents were full-time and part-time students of the first cycle (bachelor's/engineer's studies) and the second cycle (supplementary master's studies). The time scope of the analysis covers the period from November 2023 to December 2023. A survey was carried out with the participation of 245 student representatives.

Keywords: Education, Knowledge, Digital Approach, Digital Native, Learning Environment, Higher Education

1. Introduction

Digital learning provides greater control and autonomy over learning itself and enables learning in context, that is, in the place, time and conditions that the student finds most appropriate. The aim of the article is to examine what digital educational devices are needed and most frequently used in higher education.

In recent years, education has changed and been digitized. Remote and/or hybrid learning has been introduced. Which, in consequence, resulted in a change in the way of transmitting knowledge. Currently, it is important to remember to adapt it to the current situation and the requirements that students place on lecturers. The aim of this approach is to create attractive, interesting and motivating lectures and lessons for further learning. Technology and ongoing digitization have improved the effectiveness of learning and the process of acquiring knowledge. According to Mete, Riegel, Kozen, and Polka (2017), technology has not only transformed into a powerful tool in everyday life, but has also significantly influenced education. Currently, students are considered to be the first generation of the so-called "digital natives" They have grown up with technology all their lives, they know mobile phones, tablets, computers, playstation and many other electronic devices from birth (Acquah & Katz, 2020).

The first part of the article presents the characteristics of the examined student. Then, the tool and the research sample were characterized. The results, conclusions of the research, their limitations, and recommendations for further research are presented.

2. Literature Review

In the 21st century, there has been an explosion in research and learning (Krawczyk, 2022). Both lecturers and students must adapt quickly to new technological developments. It is reasonable to assume that this pace of AI development will increase.

Analyzing "4 trends that will shape the future of higher education" it can be indicated that current students, are those who can learn anywhere, from wherever they want, is to do the so-called "learning from everywhere", for whom active lectures are important (placing lectures with active learning), are those for whom it is important to learn from examples of phenomena that are relevant to the environment. And finally, they are people for whom using formative assessment instead of high-stakes exams. Real learning relies on principles such as spaced learning, emotional learning, and the application of knowledge (World Economic Forum, 2022). Students are referred to as "digital natives" (Ivan, 2022) because they have grown up with digital communication technologies since birth. Digital natives born with advanced digital media technologies are acknowledged as the first

generation of the 21st century. Digital natives are different from previous generations because they are unique addicted to the Internet. They closely follow technological developments, interact and communicate regularly through various means of mobile communication, such as mobile phones and social networking sites, they can easily express their wishes and deliver them continuously and more

access to virtual environments (Azimi et al., 2021). Digital natives show a preference for using graphics to communicate and feel comfortable with multitasking, preferring to receive immediate feedback and seek gratification (Xie et.al, 2022). This is someone who is fluent in Twitter, Facebook, Instagram, WhatsApp, SnapChat, podcasts, YouTube, online news, text messaging, instant messaging (Yue et al., 2023). They are well versed in smartphones, iPads, smartwatches and more (Piersiala, 2023). The daily lives of digital natives are influenced and governed intensely by the advancements in new media technologies due to being born in the digital opportunities such as advanced technological tools like smartphones with fast and uninterrupted internet connection (Fortunati, 2022). Also referred to as the "iGeneration" or as having "digital DNA" from birth, this group is also people raised in a "nanosecond culture." They are multitaskers and switch quickly between tasks. They are capable of performing tasks at high speed. Native digital students prefer to learn visually rather than through text; they want an environment rich in images. They like information presented in the form of graphics, charts, tables and images rather than long reading tasks.

Currently, interactive boards, virtual learning environments, e.g. Moodle, videoconferencing, applications and software, games, tablets and smartphones have started to be used more often in lecture halls (Nikou and Aavakare, 2021). Lecturers started recording podcasts, tutorials, instructional videos, e-books. They began to conduct synchronous lectures and use videoconferencing. Future employees are those who, when looking for a job, will not be defined by the diploma obtained or the degree held, but by their competencies and skills (The Burning Glass Institute, 2022). It is important to remember that the next generation that will come to study at universities is the alpha generation. This is the touchscreen generation. What defines them is: immediacy, digital-first, haptic interaction, personalization, interaction (games), incidental learning.

Education has transformed over the past few decades. Since the onset of the recent pandemic, schools and universities have been forced to put a lot of their teaching online. Technology breaks up the limitation of time and improves students' learning autonomy (Liu & Li, 2020; Huang et al., 2020). The challenge posed by the Covid-19 pandemic was the transition from classroom learning to online and hybrid learning with the use of technological solutions. At the same time, universities had to develop ways to use modern learning methods while ensuring high-quality teaching (Reis et al., 2022). Currently, interactive boards, virtual learning environments, e.g. Moodle, videoconferencing, applications and software, games, tablets and smartphones have started to be used more often in lecture halls (Nikou and Aavakare, 2021). Lecturers started recording podcasts, tutorials, instructional videos, e-books. They began to conduct synchronous lectures and use videoconferencing. Such tools and such methods are certainly conducive to the positive transfer of knowledge. It can be said that students need such tools, and lecturers need to learn to use such tools. According to Riegel and Mete (2017), students and faculty should share knowledge. There is feedback. Students have a wealth of knowledge to impart to lecturers, and lecturers have a wealth of knowledge to offer to students. Mutual learning can have many positive effects. This idea of mutual learning applies to technology (Haytham, 2023, pp. 23-33). The experience of the past two years has shown that technology is conducive to bridging time and space barriers. It has turned out that it is possible to learn asynchronously and synchronously. The opportunities arising from the development of technology in learning should be exploited, adapting to the requirements of today's students. Teaching materials supported by photos, graphics, videos should be used. Given the current trend of nanoseconds, such solutions promote flexibility and mobility for both students and lecturers.

3. Research Methodology

The aim of this study, based on the above literature analysis, is to determine how students spend their time on the Internet, what devices they use and whether the use of e-books and audio recordings (podcasts) is useful for them. People were also asked about the use of educational e-learning platforms. The main research problem in this aspect was to answer the question: How do students use the Internet? What equipment do they use for this? Is it desirable for them to use educational platforms and e-books? And also determining where (in terms of equipment) they read and would they read if they could choose?

This is a pilot study conducted on a sample of 239 students. It is planned to conduct a study on a larger research sample, covering various faculties of technical universities in Poland. The questionnaire was developed by the Center for Modern Technologies of the Gdańsk University of Technology. The study used an online questionnaire

to investigate the digital birthing of Polish students. The basic research method was the CAPI method, based on a questionnaire. It consists of two parts. The first part contains basic information about students, such as gender, age, degree and field of study. The second part concerned students' answers to questions about their study habits. The participants were informed about the purpose and course of the study and their right to withdraw from the study at any time. Generally, participants completed the questionnaire for approximately 10 minutes.

4. Results

The research was carried out in the period November – December 2023 on a sample of 239 people. The characteristics of the survey participants in the research were analyzed based on the results from the metric part of the survey. The research group represented was: 126 women and 113 men. All the respondents were students of the Czestochowa University of Technology (Poland) from the Faculty of Management, full-time and part-time students of the first cycle (bachelor's/engineer's studies) and the second cycle (supplementary master's studies). This study adopted an online questionnaire to examine Polish learners' digital nativity and their intentions to acquiring knowledge. The most respondents (48%) are aged 22 to 24. Another 35% are respondents aged 19-21. The survey was also completed by 6 respondents under the age of 18, 9 respondents aged 30-40 and 2 person over 41 years of age.

After the metrics section, the student was asked if they use a computer, tablet or smartphone to access the Internet. According to Figure 1, the most responses were given to a smartphone (174 answers) and the least to a tablet (5 answers). 96% have a Windows PC/laptop. The rest use OSX (Apple). Analyzing the distribution of responses regarding the system used on a smartphone indicated Android (52%). The rest of the students use IOS.

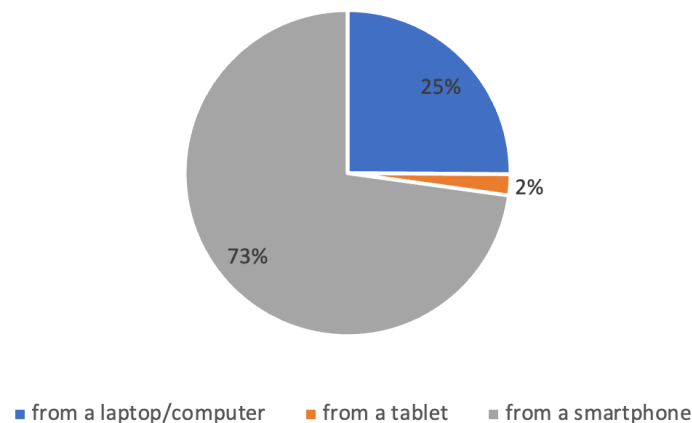


Figure 1: Preferences for spending time on the Internet

In the next question, students were asked: What is using a digital version of a textbook in the form of an ebook in the learning process for you? The distribution of responses is given in figure no.

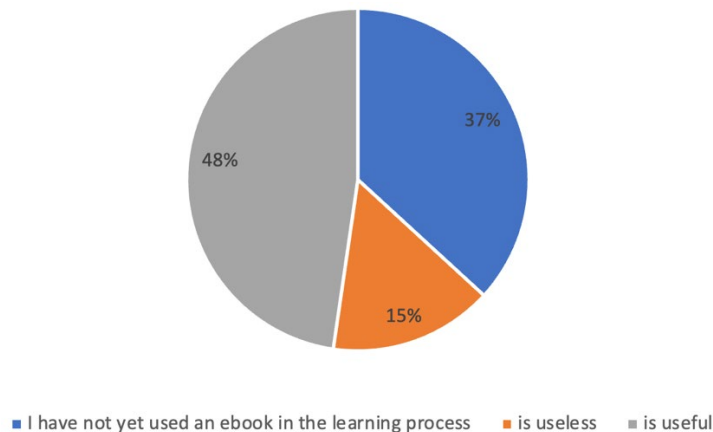


Figure 2: Preferences on using e-book in the learning process

114 respondents indicated that using an ebook (digital version of a textbook) in the learning process is useful to them. 88 respondents have not yet used ebooks in the learning process. In contrast, 37 indicated that it is a useless form of learning.

As many as 159 respondents indicated that they had not yet used an e-learning learning platform like Coursera, Doemstica, EdX or Udemy. 44 students indicated the answer "no, but I know how they work," and only 36 respondents answered in the affirmative "yes, I have used these learning platforms."

There was a similar distribution of responses to the question of what electronic equipment a student uses when watching video content, e.g. YouTube, as to the answer to the question of what device he uses when accessing Internet content. 66% then use a smartphone, 32% use a computer/laptop, the least 2% use a tablet.

In response to the question "The benefits of using audio/podcasts in learning for me are?" as many as 41% has not yet used this form of acquiring knowledge in the learning process. According to 22% of respondents, it is an unhelpful tool, while 15% more respondents indicated that it is a useful tool for them.

The next question was about reading various content, not only on the Internet, not only in the context of learning. The distribution of answers indicates that respondents are most likely to read using a smartphone (126 indications), followed by the answer: traditional books, printed press, other publications in paper form (67 indications), on a laptop/computer (28 responses) and the same number (9 indications) for the answers: on the tablet and on the e-book reader. The answers are shown in Figure 3.

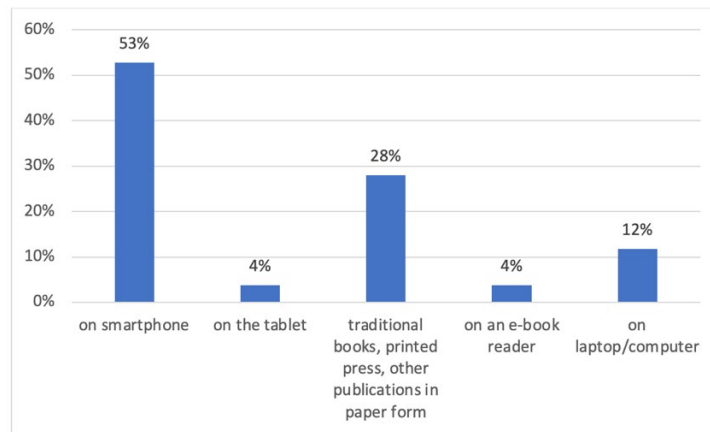


Figure 3: Answer the question "I read most often (not only in the context of learning)".

The survey questionnaire also asked where the student would most like to read. Analyzing the distribution of answers, it can be indicated that respondents would most like to read using a smartphone (96 indications), followed by the answer: traditional books, printed press, other publications in paper form (83 indications), on a laptop/computer (43 indications). The fewest indications concerned the answers: on a tablet (9 indications) and on an e-book reader (8 indications).

The answers obtained are shown in the figure 4.

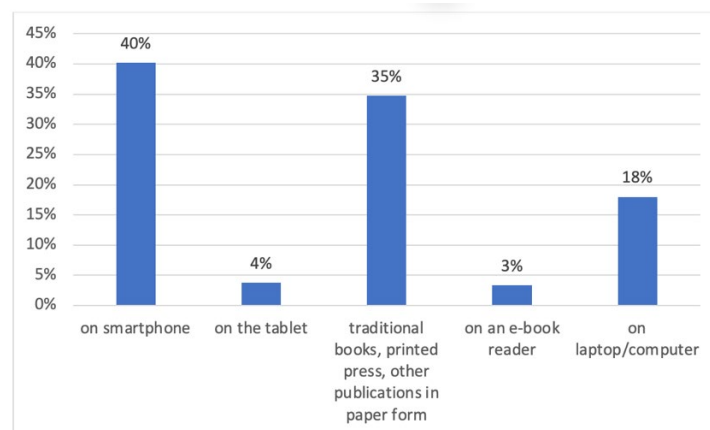


Figure 4: Answer the question “I would most like to read”.

Summing up, it can be said that the person in our study is accustomed to using a smartphone on the Internet, both in terms of time spent on the Internet, as well as in terms of reading various content, not only related to science, and the willingness to read in general. The smartphone is also the most popular tool for watching video content on the Internet. The respondent does not use educational platforms used in e-learning, although he knows them. He assesses the use of the electronic version of the textbook as useful, but does not use audio recordings/podcasts in learning.

5. Summary

Analyzing the research results obtained, lecturers and students should focus on mutual learning, and lecturers should adapt their teaching methods to current challenges.

The author believe that education has been changing in recent years. Mutual teaching and learning is important. There are several opportunities to share knowledge between generations, one can learn from each other. Teachers or university lecturers need to undertake the creation of classes using a variety of technologies, adapt the topics presented to the current requirements of students. Universities need to move towards active learning and teaching skills that will survive in a changing world. Lecturers need to teach are skills that remain relevant in new, changing, and unknown contexts.

This study had some limitations. Firstly, considering the large population of Polish university students, the sample size was comparatively small, and the results of the study cannot represent all Polish university students. Further studies were suggested to enlarge the sample size. It is planned to conduct this study in other academic units in Poland and compare the results achieved between universities. It is also planned to increase the survey sample. Interestingly, when conducting the survey, many students were eager to discuss their expectations for teaching with modern technologies.

It is important to remember that the next generation that will come to study at universities is the alpha generation. Future employees are those who, when looking for a job, will not be defined by the diploma obtained or the degree held, but by their competencies and skills (The Burning Glass Institute, 2022).

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