

THE EFFECTS OF DIGITAL TECHNOLOGY ON LEARNING

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Abstract

In recent decades, digital technology has made remarkable advancements across various fields, including education. This study aims to investigate the influence of technology on the learning process in primary schools, while also exploring the advantages and disadvantages that technology introduces. The goal is to emphasize the clear positive impacts of integrating technology in education, without overlooking the potential negative effects that this modern teaching and learning tool may have within the classroom environment.

Utilizing both quantitative and qualitative research methods, surveys will be conducted to gather data from students and teachers to understand their perspectives and the extent of digital technology used at the schools. The research is expected to demonstrate that technology-enhanced teaching has significantly progressed, simplifying access to information and enabling exploration of diverse subjects through digital means. Additionally, during this study I will attempt to examine the impact of AI tools like ChatGPT on students, which many researchers believe can facilitate information acquisition. However, since not all information provided may be accurate, there is a risk of overreliance, which could affect the development of genuine knowledge.

The study will conclude with a set of recommendations for teachers and institutions, highlighting the significance of modern teaching approaches, the effects of digital technology on learning, and the associated challenges and benefits.

Keywords: Technology, students, teaching, ChatGPT.

Introduction

Being aware that we live in the era of technological advancement, we must accept that this phenomenon has noticeably changed the development of teaching and learning in primary schools. The use of different digital platforms in teaching has brought visible benefits and challenges that directly influence the learning process. The use of technology in primary schools is a topic of great importance, considering that it is a very critical age and a decisive phase for forming the basic foundation in gaining students' skills. The benefits that technology brings are many and have an impact on students' engagement to explore fields and to gain different knowledge, access to learning resources and various information. But there exists a very big risk that the inadequate use of this phenomenon may cause consequences that are irreparable. During this study I will also stop and analyze the effect of ChatGPT in primary education, how and how much students use it. This phenomenon that has taken over the world in general can also have benefits if used within the right boundaries without harming critical thinking, but not to be exceeded and to take every information as definitive because according to researchers not always the information it gives is accurate. This artificial program can create dependency and can deprive students from gaining natural knowledge.

Teaching and Learning

According to DigCompEdu, digital technologies can improve and advance teaching and learning strategies in different ways. However, whichever strategy or pedagogical approach is chosen, the specific digital competence of the teacher stands in the effective organization of the use of digital technologies in the different phases and contexts of the teaching process. The core competence in this field and perhaps of the whole framework is Teaching. This competence refers to the design, planning, and implementation of the use of digital technologies in the different phases of the learning process. Thus, digital technologies can be used to facilitate the active engagement of students, for example when they:

- explore a topic,
- experiment with different possibilities or solutions,
- understand the connections between concepts,
- create creative solutions, or
- create a product and reflect on it. (European Framework for the Digital Competence of Teachers)

Challenges in Integrating Technology for Primary School Teachers

Being aware that in this era, digitalization and digital tools have become strategies for teachers and students, especially in primary education, this phenomenon often enables active participation and gives students the opportunity to gain new skills for the 21st century. Furthermore, insecurity in teacher training and insufficient classroom management strategies often worsen these problems, hindering the overall learning experience of a child (UNESCO, 2021). Technology gives us innovative solutions for these challenges, providing us with tools and platforms that improve teaching and learning processes, while bridging gaps in educational equity (Smith & Johnson, 2021). Educational technology is seen as a wide range of technologies and digital resources that teachers and students can use to facilitate learning processes. The constructivist philosophy shows us that students actively build information and learn through their experiences, but also recognizes the importance of using digital learning tools to facilitate collaborative and practical activities, as well as learning through experience (Kolb, 1984).

Also, Vygotsky's Social Development Theory (1978) emphasizes that learning occurs through situational experiences. For teachers to improve learning performance and produce a competitive student, technology integration should be used, such as interactive whiteboards, online learning platforms, and gamification, which offer learning experiences and contextualization for students (Smith & Doe, 2023). Although technology is playing a critical visible role in student engagement in learning, gamified learning applications were introduced to motivate active participation among young students (Kay et al., 2019). As can be seen, technological tools for attendance tracking, monitoring student performance, and promoting continuous communication between teachers and parents were developed for online purposes, strengthening classroom management (Selwyn, 2016).

Technology and the Adaptation of Teaching Methods with Digital Platforms

Educational technology in today's days has become a form of continuous development in contemporary education, which constantly integrates teaching tools and techniques, platforms, and

new methods for improving students' learning. One of the most important elements in the last decades is the integration of digital platforms in all fields, including education. By including learning management systems, which help teachers plan and manage content through various tools, making cooperation and engagement in teaching easier. Based on Hassan's study, in many parts of the world, the best educational institutions are often concentrated in urban centers, leaving those who live in remote or rural areas in a disadvantaged position. However, with the emergence of online learning platforms and digital resources, the importance of physical location has decreased. Today, a student in a remote village can potentially have access to the same resources as a student in a big and busy city. Hassan.G (2023). Roli i teknologjisë në ne epoken qe po jetojm tash a eshte me fjat te mija ndrysheështë thelbësor dhe nuk mund të nënvlerësohet. Platforma virtuale që ofrojnë mesim online apo klasa-grupe virtuale na lejne te kuptojm se arsimi cilësor të mos jetë më privilegj vetëm për nxenesit që jetojnë apo udhëtojnë nga vendet rurale drejt qendrave urbane (Fisher, Dwyer, & Yocam,1996).

Benefits of Digital Technology in Schools

Technology has revolutionized education, transforming the way students learn and teachers teach. With the integration of digital devices, educational software, and online platforms, classrooms have become more interactive and dynamic environments. Technology in education allows access to a wide range of educational resources, promotes collaboration among students, and facilitates personalized learning according to the individual needs of each student. By meaningfully integrating technology into the curriculum, students develop essential skills such as critical thinking, problem-solving, creativity, and collaboration, which are crucial for success in a globalized, technology-driven economy (Barbosa, 2014). Learning management systems and adaptive assessment software provide detailed data on students' performance, enabling educators to personalize teaching based on individual needs and track progress over time (Conte, Martini, 2015). Another important benefit of technology in education is its ability to prepare students for the 21st-century job market, where digital skills and the ability to use technology fluently are increasingly valued. By meaningfully integrating technology into the curriculum, students develop essential skills such as:

- Critical thinking,
- Problem-solving,
- Creativity,
- And collaboration,
- Which are essential for success in a globalized, technology-driven economy (Barbosa, 2014).

The Role of Artificial Intelligence (AI) in Students

Before discussing the impact of AI on equity and inclusion in education, it is necessary to define AI and examine how AI can be applied in educational contexts in general. The definition of AI is an important, but also challenging, step in the ever-changing world of technology. This working paper adopts the OECD definition as recommended by the Artificial Intelligence Council (OECD, 2023, p. 7). Some AI-driven tools may hinder students' social skills, sense of trust, and empathy toward others, unintentionally reducing the need for human interaction, which leads to greater student dependence on digital interfaces (Pons, 2023). This is stated in the context where some

researchers have expressed concerns about the ability of AI tools to read cognitive or emotional states, with unequal inaccuracies affecting people with disabilities or from different cultural backgrounds (Holmes & Porayska-Pomsta, 2022). To give greater importance to “21st Century Skills” in the last decade, generative artificial intelligence (GenAI) tools have gained significant momentum. Now, what is taught and the way it is assessed must be carefully reconsidered. Researchers from different fields have already stated how teaching and learning can be modified in order to better develop mastery of certain skills or knowledge. At the conclusion of this, the question remains: What will students be able to achieve in the era of generative AI? This means adapting and redesigning curricula to respond to the needs of society and to prepare students for the future (OECD, 2020). Based on Pons (2023), we can say that previous literature has highlighted some skills that need to be analyzed and strengthened, as well as how teachers can approach them in the classroom in this regard. In the era of generative artificial intelligence, the skills mentioned below may be particularly important:

- **Digital skills and the use of AI:** This allows us to understand the inclusion of students in equipping them with digital tools in general and in particular with artificial intelligence. Students must be able to distinguish artificial intelligence from human intelligence and be able to understand the benefits and challenges of each.
- **Learning skills:** All of this leads us to an analysis of how we learn and how we understand our learning activity, as well as the understanding of skills such as social intelligence, collaboration, creativity, and innovation.
- **Mastery of knowledge:** This relates to the information we know about the world, but also to what we are aware of regarding our knowledge – how to understand it, what is concrete, what constitutes good evidence, and how to make evidence-based decisions. Mastery of knowledge also means being able to accurately assess skills, emotions, and personal context – including all aspects of human intelligence.

Methodology

This paper aims to investigate, analyze, and interpret the effects of digital technology on the learning process. A special focus of the study is the impact of programs such as ChatGPT, as well as the dependency that their use may create, influencing students’ critical thinking. Furthermore, it aims to assess the level of teachers’ preparedness for using technology and the need for additional training to ensure its effective integration into teaching.

Objective

The objective of this paper is to investigate the effects of digital technology on the learning and teaching process, by analyzing how it is used by students and teachers, as well as the positive and negative impacts it brings. It also aims to identify the importance of digital technology in education, analyze the impact of programs that provide ready-made information such as ChatGPT, the level of dependency they may create for students, and the difficulties teachers face in applying it.

Research Methods

Theoretical analysis method – Through this method, we will analyze the theory we are using, examining the viewpoints of various local and international authors, selecting those that are relevant, evaluating and comparing them, and drawing different results and opinions in accordance with our paper.

Empirical method – Through this method, we will rely on experience and support from the past, analyzing the impact of digital technology in recent decades in primary education, from which certain judgments about it will be drawn.

Survey method – Through this method, we will obtain results and conclusions regarding the use of digital technology and the effects this phenomenon has brought in education, where participants will include 50 teachers and 50 students.

Analysis of results

As we have presented above, the aim of this research is the analysis and interpretation of the topic: the effects of digital technology on students, to analyze the existing situation in the use of technology – the difficulties and challenges that teachers face during its use. Furthermore, the research is also focused on students and the digital programs they use to gather knowledge, the challenges, and the negative aspects that this phenomenon brings.

The research was conducted in 5 schools in the municipality of Drenas, where one school was urban, one was semi-urban, and 3 schools were at the rural level. The research included 50 teachers and 50 students surveyed. In all schools, questionnaires were distributed equally, with 10 teachers and 10 students for each school. The accuracy of this research is 98%, while potential errors are $\pm 2\%$.

Bio-social Data

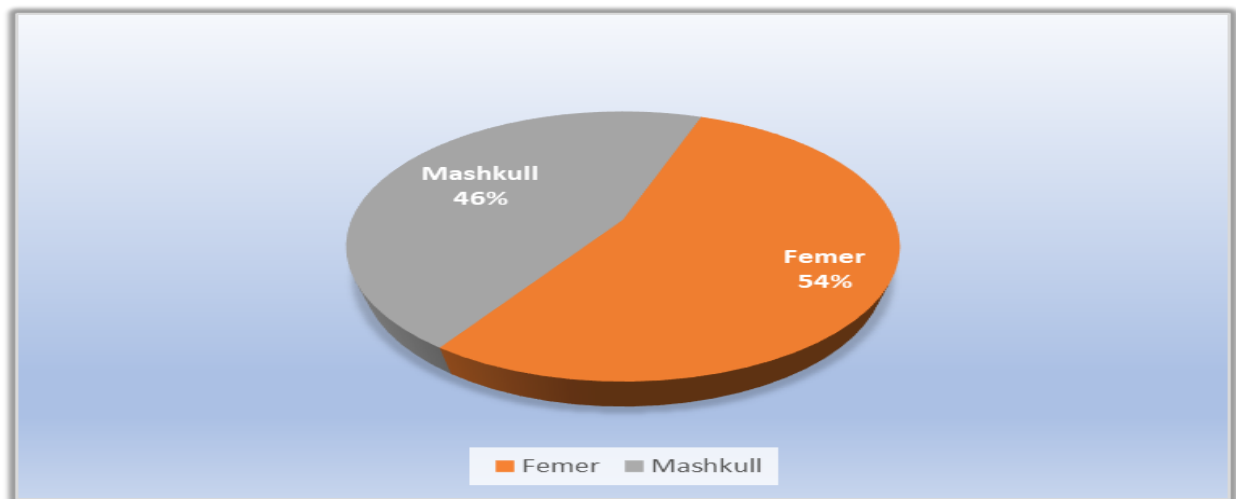


Figure 1 – Gender

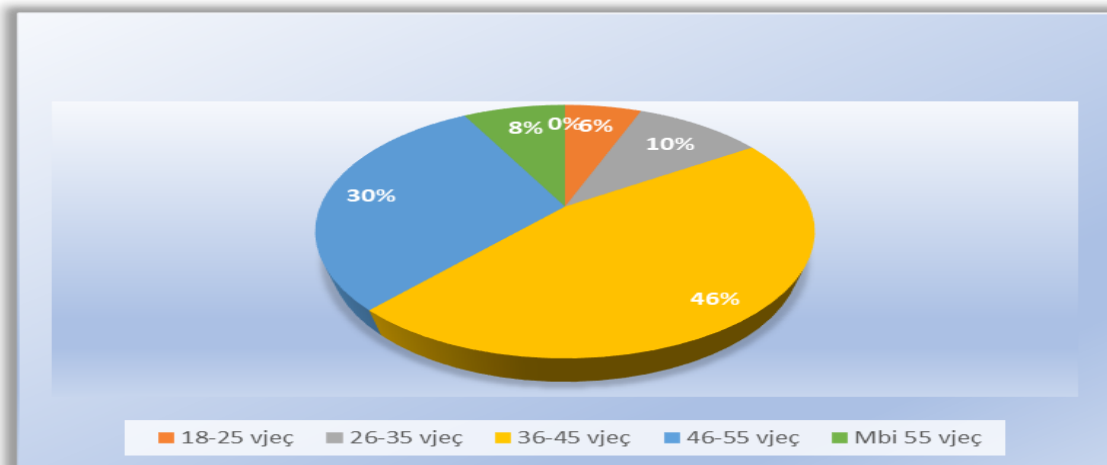


Figure 2 – Your Age

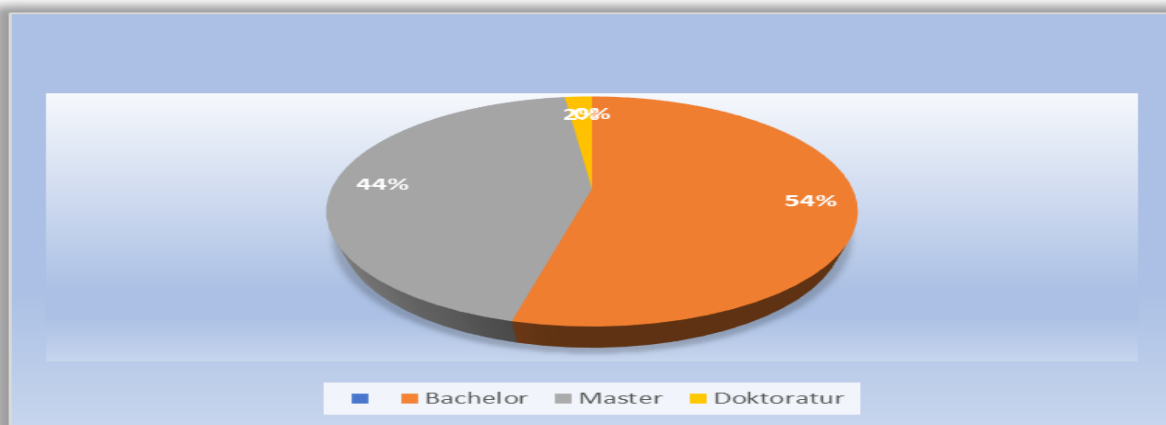


Figure 3 – Education Level

According to this research, 50% of the teachers have a Bachelor's degree, while 48% of the respondents hold a Master's degree, and 2% have a Doctorate.

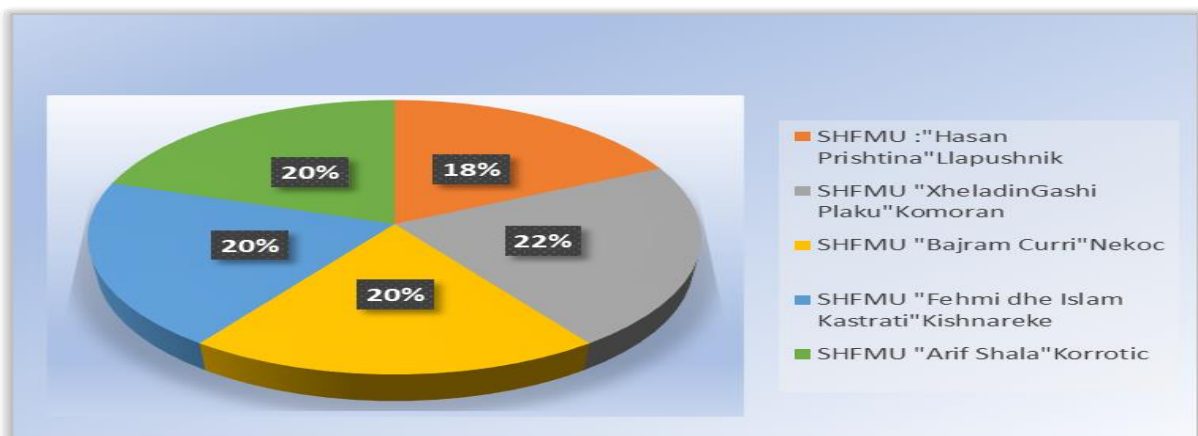


Figure 4 – School

As observed in Table 4, all schools, including urban and rural areas, were surveyed equally, covering all teachers, and this statistic reflects the schools where teachers provide instruction across different schools.

Research Questions

Question 1 – Do you have difficulties adapting your teaching methods to digital platforms

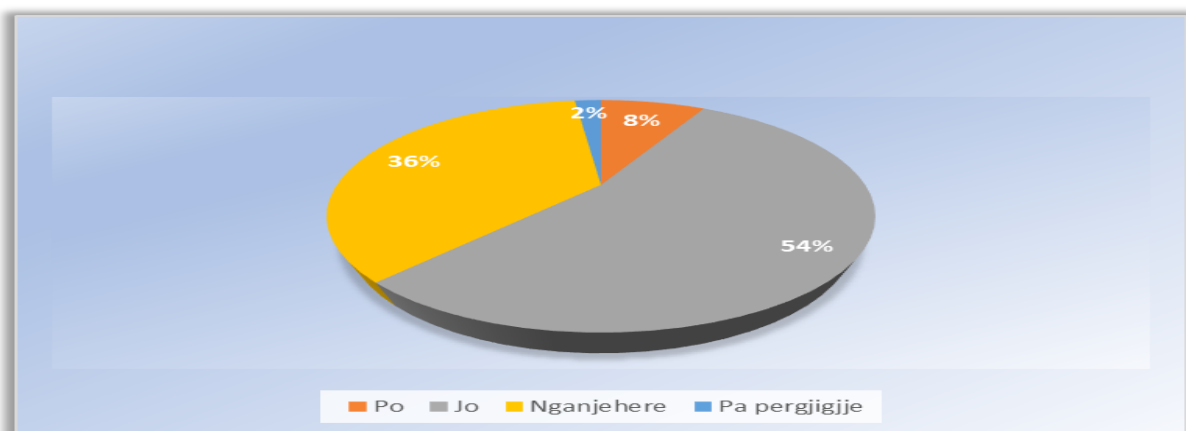


Figure.1

Based on Figure 1, regarding the question: “Do you have difficulties adapting your teaching methods to digital platforms?” where 50 teachers were surveyed, we have the following responses: 56% of them reported no difficulties, while 36% occasionally encounter difficulties. Thus, only 8% of teachers experience challenges in adapting their methods to digital technology. From the research results, more than half of the teachers stated that they do not have difficulties adapting their teaching methods to digital platforms (see Table 1, respectively Figure 1).

Question 2 – How much does digital technology help you in the teaching-learning process?

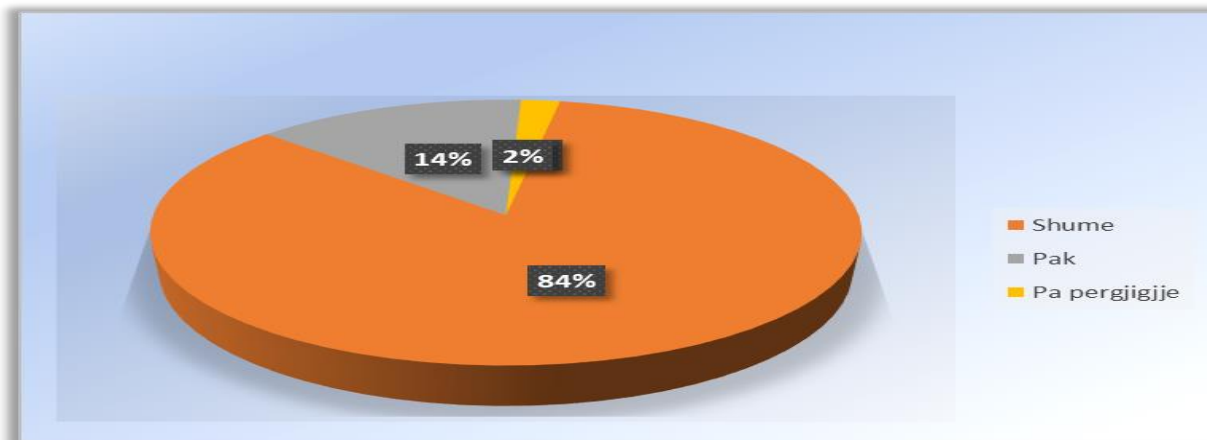


Figure.2

In the question regarding how much digital technology helps teachers in the teaching process, 80% responded that it helps them a lot, while 18% of the respondents answered “A little,” and only 2%

did not provide an answer. Therefore, as shown in the figure presenting the results obtained from the research conducted with teachers in schools, the vast majority of them agree that digital technology is helpful in the teaching process.

Question 3 – How do you assess students’ willingness to learn through technological devices?

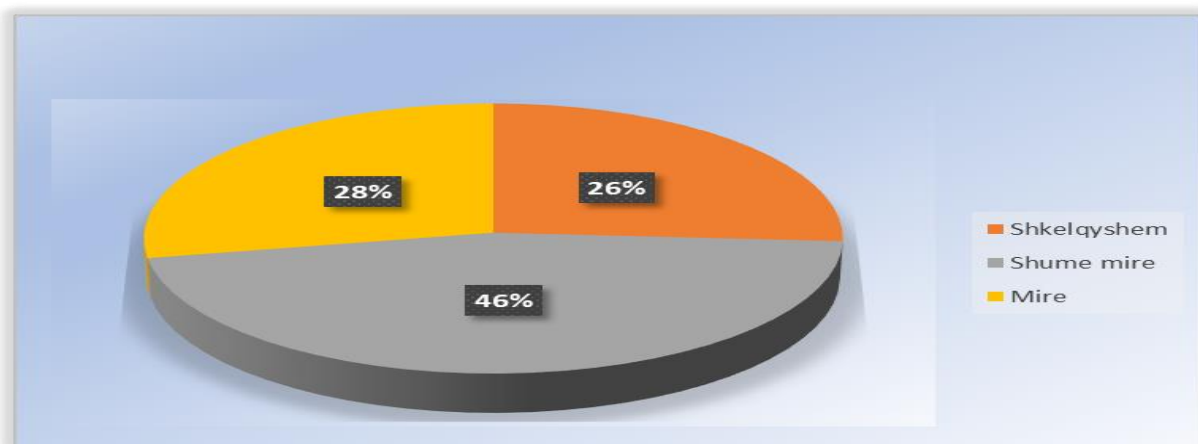


Figure.3

In Figure 3, the following question is presented: How do you assess students’ willingness to learn through technological devices? According to the respondents in this study, 46% answered *very good*, 30% of the respondents answered *excellent*, while 28% answered *good*. Based on the results obtained, as shown in the figure, the majority of teachers stated that students’ willingness to learn through technology is very good (46%).

Question 4 – Do you have difficulties in using technology?

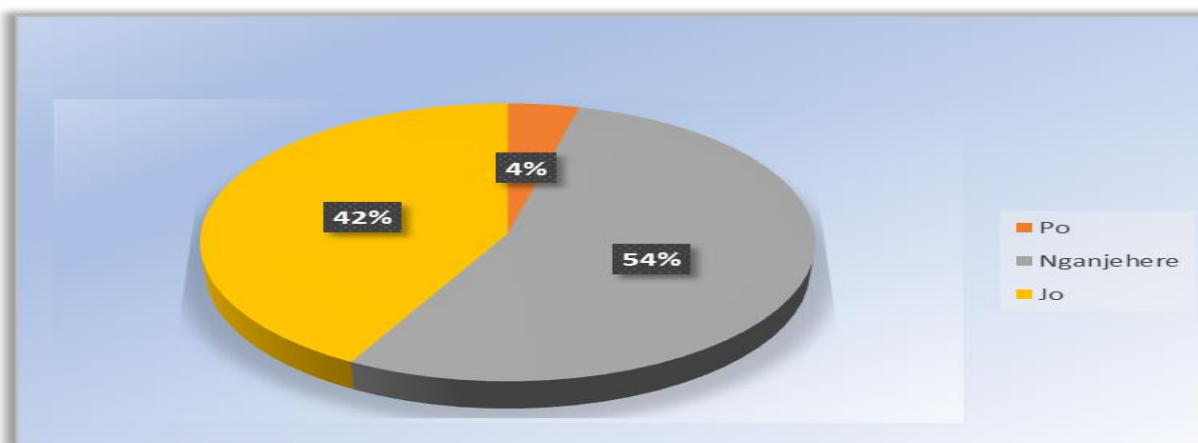


Figure.4

In the question regarding whether teachers have difficulties in using technology, 54% reported that they do not have difficulties, which means they use it and work with it, while 42% of teachers answered that they sometimes encounter difficulties. Only 4% of teachers stated that they have

difficulties in applying and using technology (see Figure 4). Based on the teachers' responses, we can conclude that 54% of the respondents do not have difficulties in using digital technology.

Question 5 – How well is your school equipped with technological devices (computer, smartboard, etc.)?

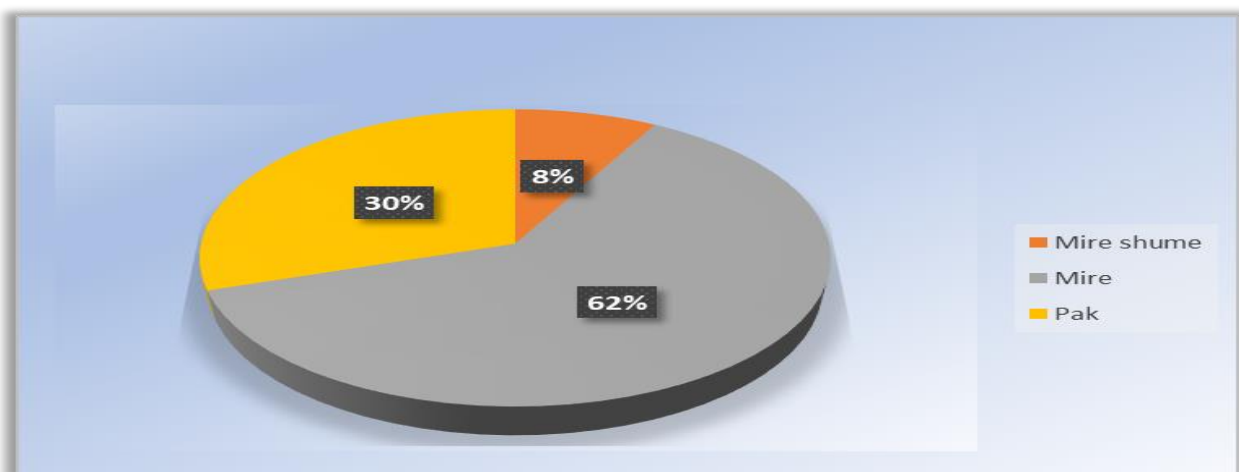


Figure.5

In Figure 5, regarding the question addressed to the respondents: How well is your school equipped with technological devices (computers, tablets, smartboards, etc.)?, the answers are as follows: 62% responded that the school is well equipped with technological devices, 30% answered a little, while only 8% gave the answer very well. As can be seen from the teachers' responses, the majority of respondents stated that the school is well equipped with technological devices, with 62% indicating Well.

Question 6 – Do you think that the use of technology motivates students to learn?

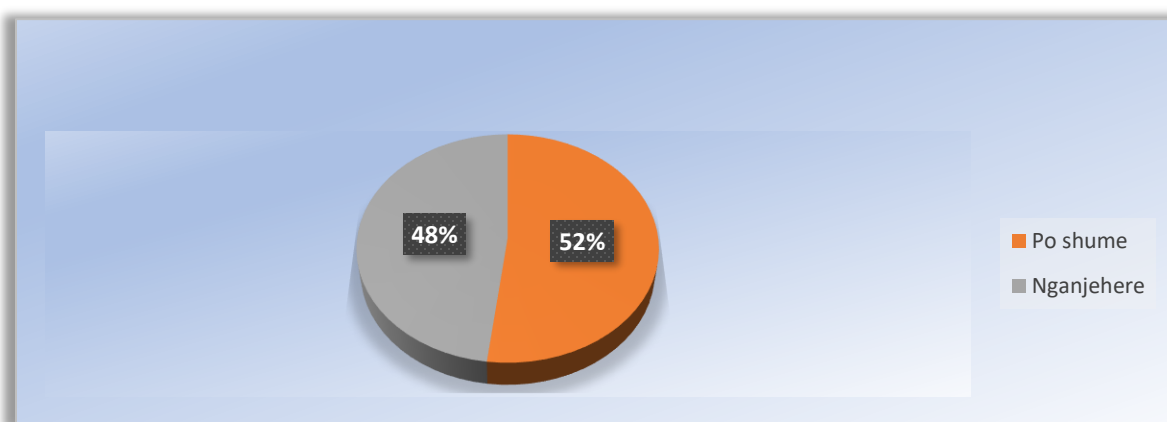


Figure.6

To the question: Do you think that the use of digital technology motivates students to learn?, 52% of teachers agreed and answered Yes, very much, while 48% responded Sometimes. As shown in the table and the corresponding figure, none of the respondents chose the answer No, it does not help, which indicates that the overwhelming majority of teachers—52%—agree that technology greatly motivates students to learn.

Question 7 – What do you think about students who use their phones during the lesson?

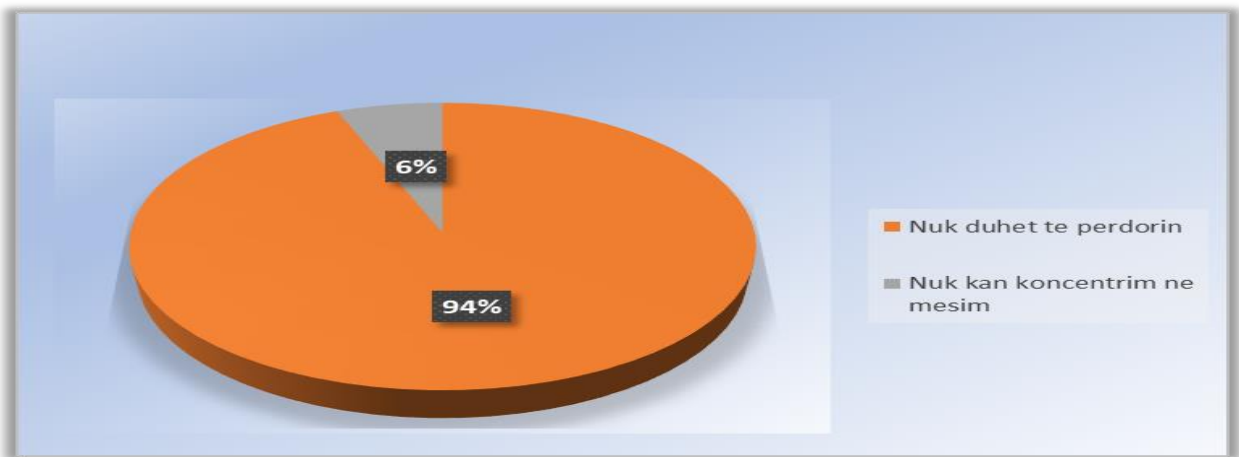


Figure.7

In the question about what teachers think regarding students using phones during class, 94% of respondents answered that students should not use their phones, while 6% stated that students lack concentration. There were no responses suggesting that phone use should be allowed. Thus, as shown in the table and in Figure 7, teachers largely disagree with students using phones during class (94%), and a small percentage emphasize that students lose focus when using their phones.

Question 8 – Do you think technology is important in the teaching process?

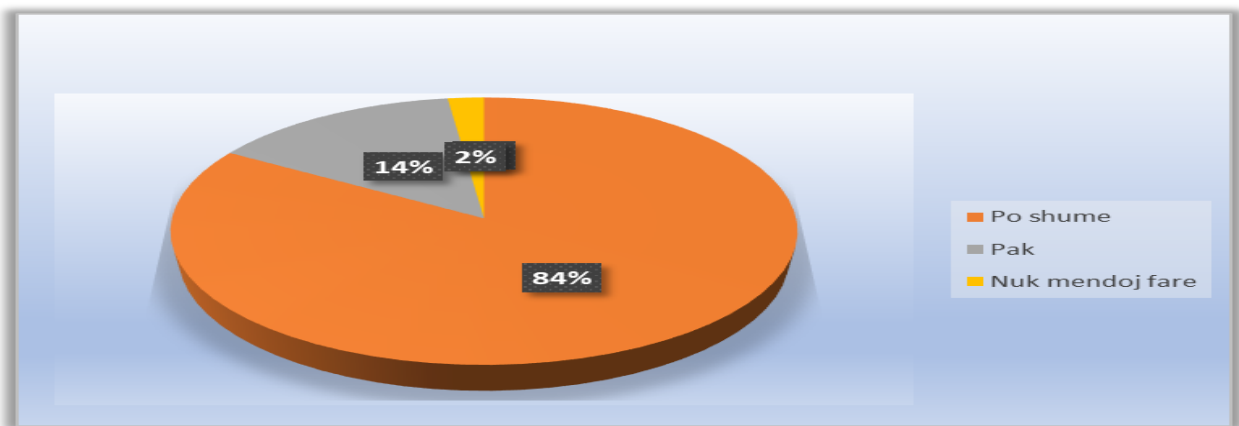


Figure.8

In Figure 8, regarding the question: “Do you think digital technology is important for the teaching process?”, the absolute majority, 84%, answered “yes, very much.” Fourteen percent responded “a little,” while only 2% do not consider it important at all. From the results obtained from the respondents’ answers, 84% of teachers consider digital technology to be very important for the teaching process.

Question 9 – In your opinion, do programs like ChatGPT and others harm students’ critical thinking?

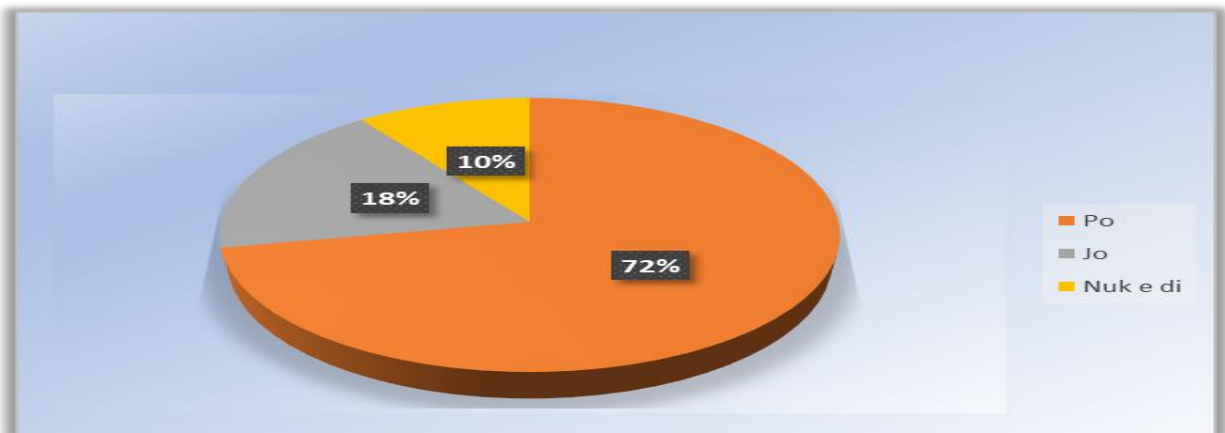


Figure.9

In the question regarding technological programs such as ChatGPT and others, whether they harm students’ critical thinking, the responses are as follows: 72% answered Yes, 18% answered No, and only 10% answered Don’t know. Based on the table, or the corresponding figure, the majority of teachers, 72%, stated that digital programs like ChatGPT and others harm students’ critical thinking.

Question 10 – What is your opinion on digital programs such as ChatGPT and others; do they create dependency in students?

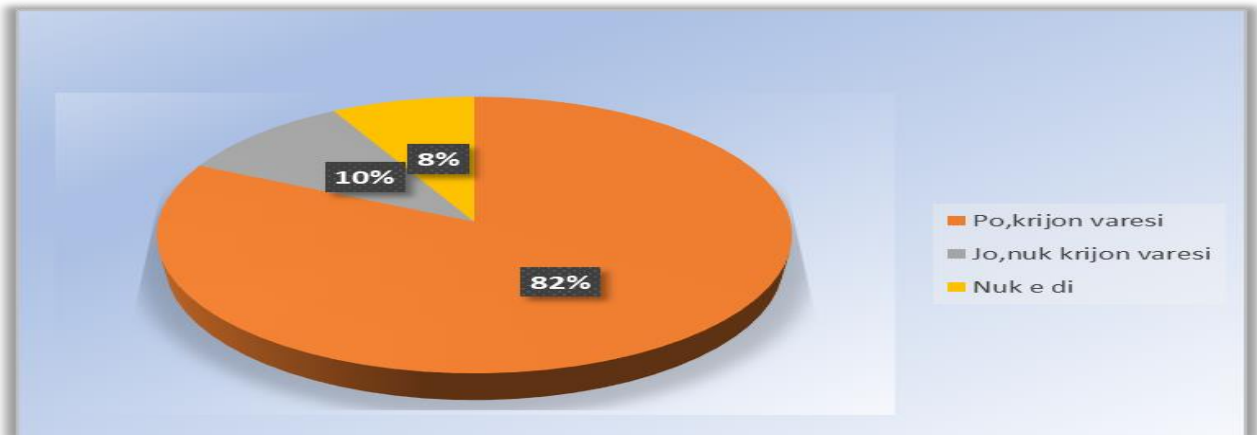


Figure.10

For the final question: “What is your opinion on digital programs such as ChatGPT and others; do they create dependency in students?”, the respondents’ answers are as follows: 82% emphasized yes, it creates dependency; 10% said no, it does not create dependency; while 8% do not know whether digital programs create dependency or not. In conclusion, based on the results from the teachers’ responses, we can say that digital programs, such as ChatGPT, create dependency in students.

Bio-social data of students

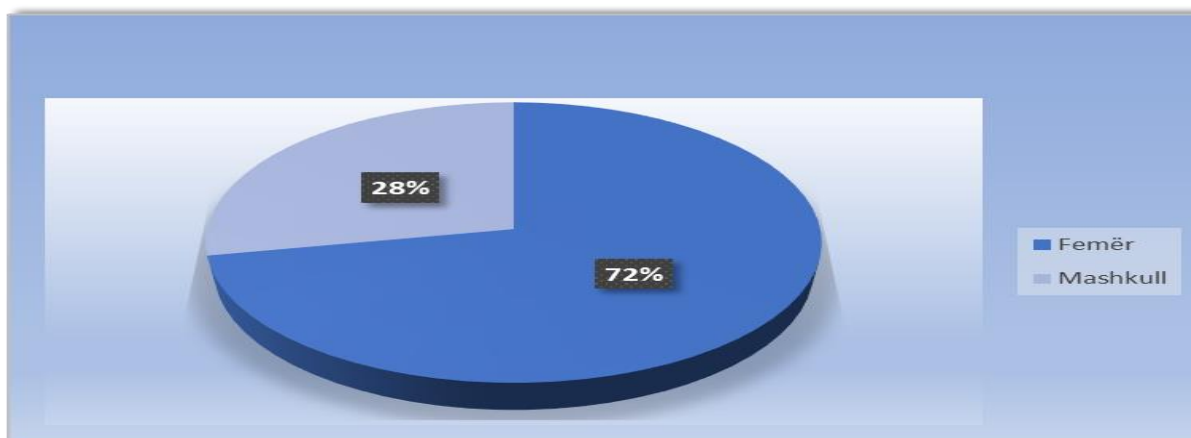


Figure 1 – Class

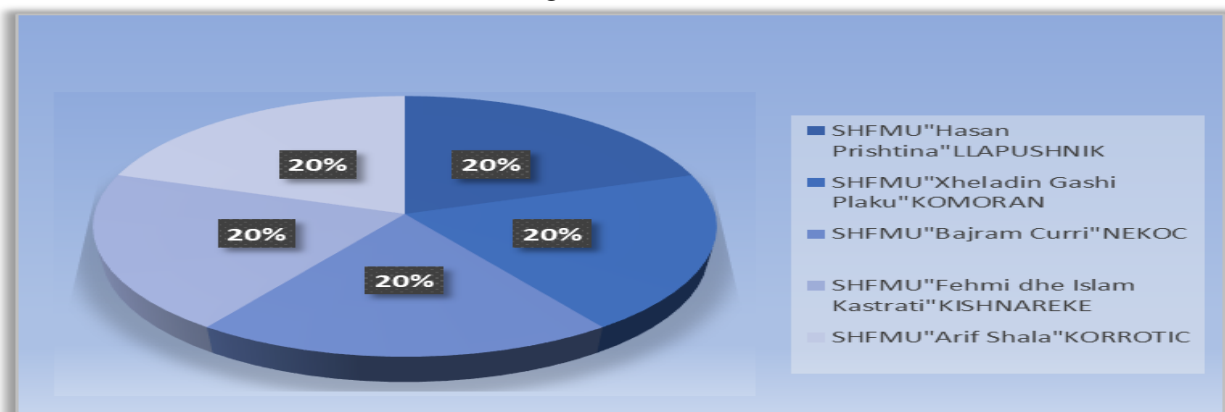


Figure 2- School

As shown in Figure 2, the respondents are 50 students from 5 schools in the municipality of Drenas, where one school is urban, one is semi-urban, and 3 schools are at the rural level. The number of respondents is equal in all schools.

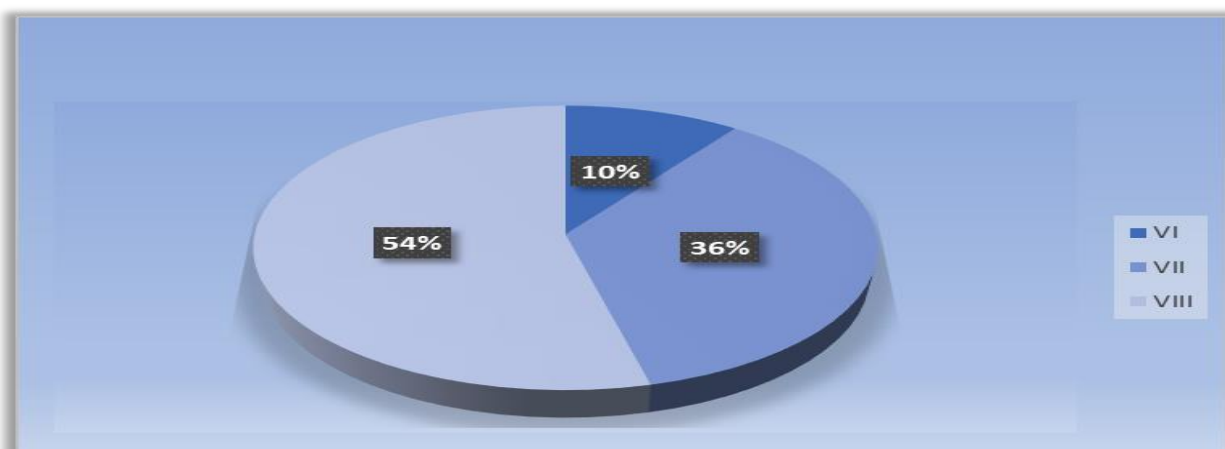
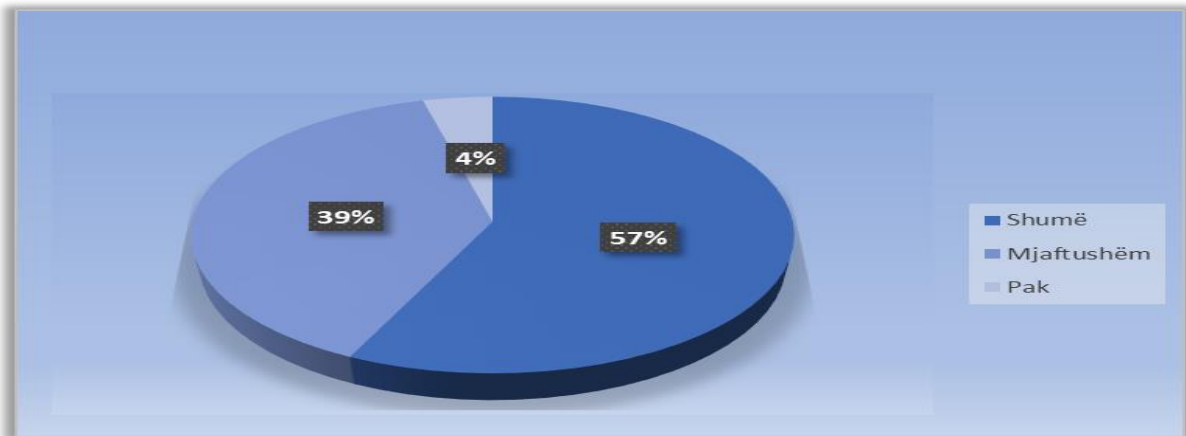


Figure 3 – Class

The participants surveyed on the topic of the effects of digital technology on students were mainly students from grades VI, VII, and VIII. The reason for surveying these students is that, at this age, they quickly evolve in technology and may also misuse it due to insufficient information about the risks of this phenomenon.

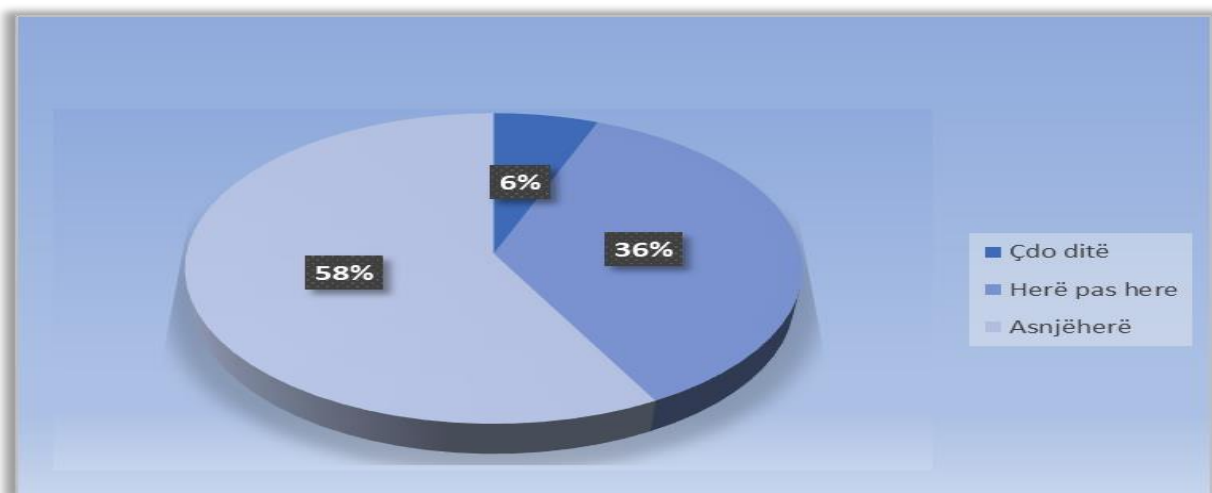
Research Questions

Question 1: How much does digital technology help you in the learning process?



Based on the responses of the participants to the question: How much does digital technology help you in learning?, 57% of the respondents answered a lot, 39% answered moderately, while 4% of the respondents stated that digital technology helps them a little. From the results obtained, we can observe that the majority of students, 57%, declared that digital technology helps them significantly in the learning process.

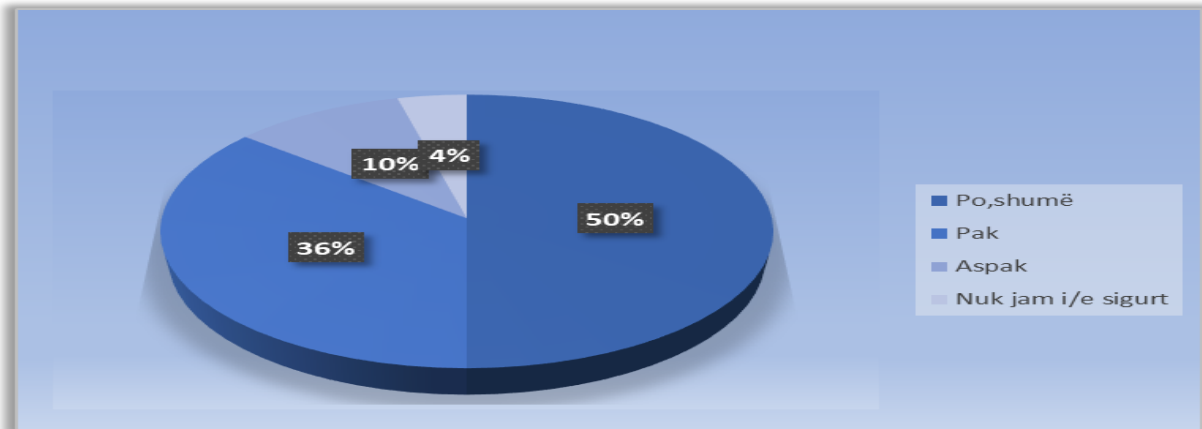
Question 2: How often do you use technology and programs like ChatGPT or others during class time?



In Table 2, specifically in Figure 2, regarding the question: How often do you use technology and programs like ChatGPT or others during class time?, 36% of the respondents stated that they use

technology and the ChatGPT program occasionally, while 58% said they never use it. Therefore, this question shows that a large percentage of the respondents never use the digital program ChatGPT during class time (see Table 2, specifically Figure 2).

Question 3: Do you think that ChatGPT creates dependence and harms natural learning?



In the following question, Do you think that ChatGPT creates dependence and harms natural learning?, the respondents' answers were as follows: 50% answered Yes, a lot, 36% answered a little, 10% answered not at all, and 4% were *not sure*. From this question, it is observed that 50% of the students are aware that the ChatGPT program creates dependence and harms natural learning, which shows that the students understand that this phenomenon negatively affects the learning process and creates reliance.

Question 4: If you use ChatGPT, do you use it for homework?

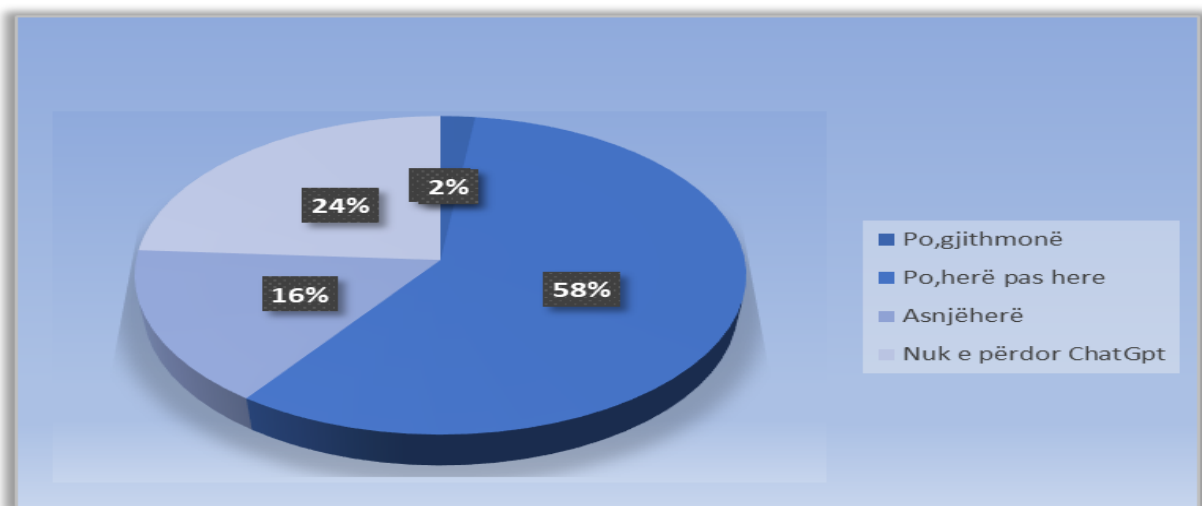


Figure 4

The data presented in Table 4, specifically in Figure 4, regarding the question: If you use ChatGPT, do you use it for homework? show some inconsistencies compared to the previous question in Figure 3. In Figure 3, 50% of the students stated that they do not use ChatGPT, whereas, as seen

in Figure 4, which contradicts the previous question, 58% indicated that they use ChatGPT for homework occasionally, 24% never use it, and only 2% said Yes, always. This allows us to understand that students use ChatGPT for homework, which conflicts with the previous question, Do you think programs like ChatGPT create dependence and harm natural learning?, where 50% emphasized that it creates dependence, while the same students, 58%, stated that they use it occasionally for homework.

Question 5: Do you feel that technology is wasting your time with games and activities that have no value?

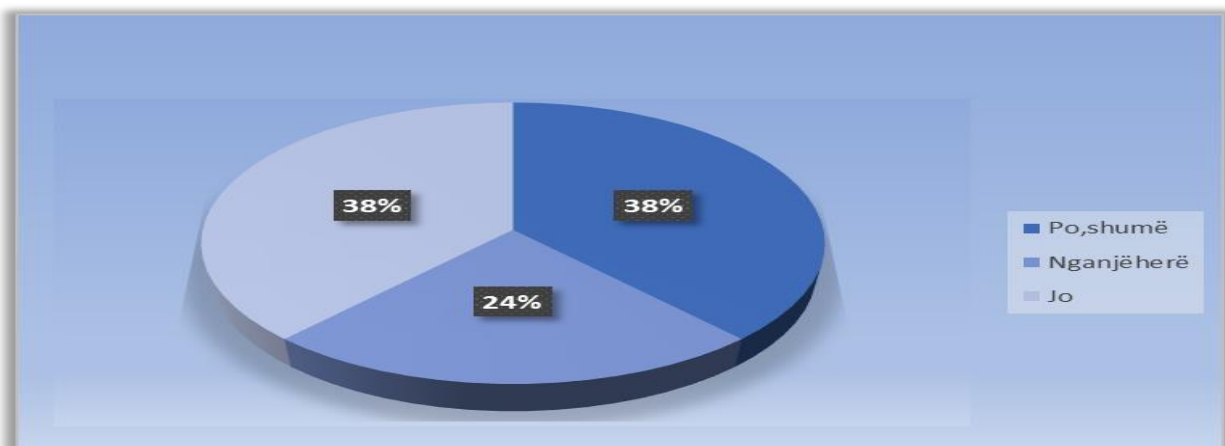


Figure.5

In the question regarding whether students feel that technology is wasting their time through games and activities that have no value, two response groups emerged with the same percentage. Among the respondents, 38% stated *Yes, a lot*, 38% said *Sometimes*, while 24% do not believe that technology and technological games waste their time. As seen from Table 5 and Figure 5, it can be concluded that students are aware that technological games can contribute to wasting time on activities that have no value.

Table 6: In your opinion, how useful is technology in learning?

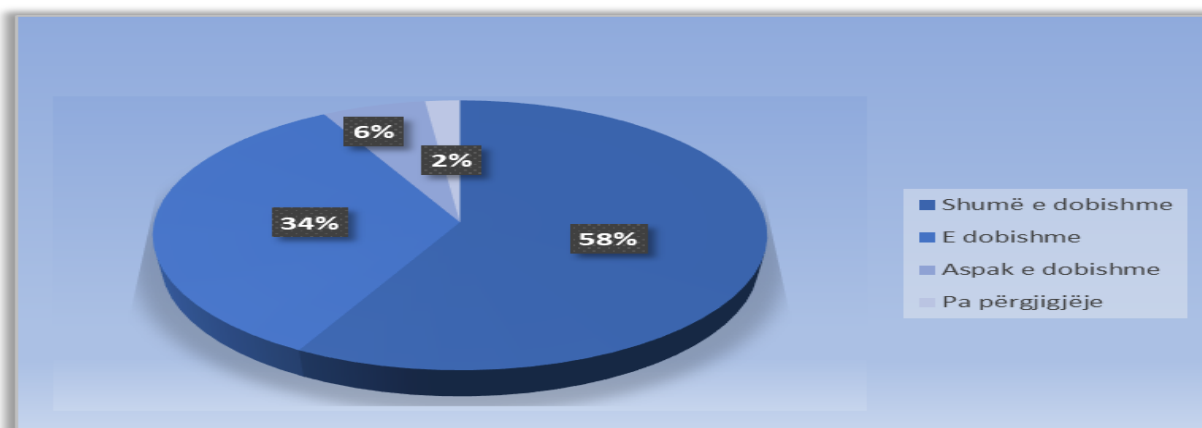


Figure 6

The data presented in Table 6, specifically in Graph 6, regarding the question: In your opinion, how useful is technology in the learning process?, show that 58% of the respondents answered *Yes, very useful*, 34% said *useful*, 6% said *not useful at all*, and 2% did not answer. From all this, we can conclude that technology is very useful in the learning process and that students benefit from it.

Question 7: Do you think that technology is essential for the development of the learning process?

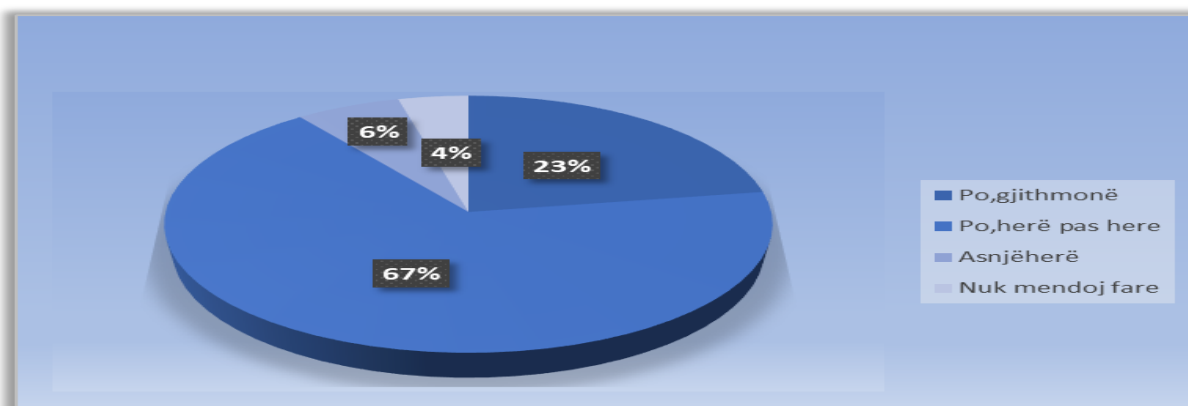


Figure 7

Based on the results presented in Table 7, specifically in Figure 7, regarding the question: “Do you think that technology is essential for the development of the learning process?”, the results are as follows: *Yes, very much* 67%, *Yes, occasionally* 23%, *Never* 6%, *I don’t think so at all* 4%. From the data obtained on the necessity of technology in the learning process, the vast majority of students emphasize that technology is essential for the learning process. This indicates that students explore and learn through digital technology.

Question 8: Do you think there are cases where technology and devices like phones and tablets used by students should be banned by the school and in the learning process?

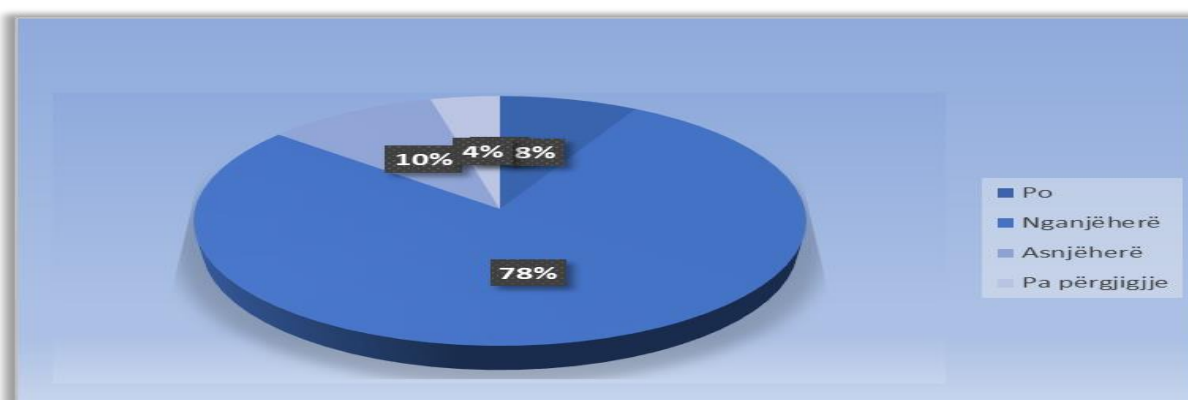


Figure. 8

Based on the data obtained for the question: Do you think there are cases where technology and devices like phones and tablets used by students should be banned by the school and in the learning process?, and referring to the responses in Graph 8, the answers are as follows: 78% answered

sometimes, 10% never, 8% yes, and 4% did not answer. From this, it can be concluded that students do not agree that the use of technological devices should be allowed during the learning process, and it shows that the students themselves are aware that this phenomenon distracts them from learning.

Table 9 — How important is technology to you, and do you use it to gain knowledge in different fields?

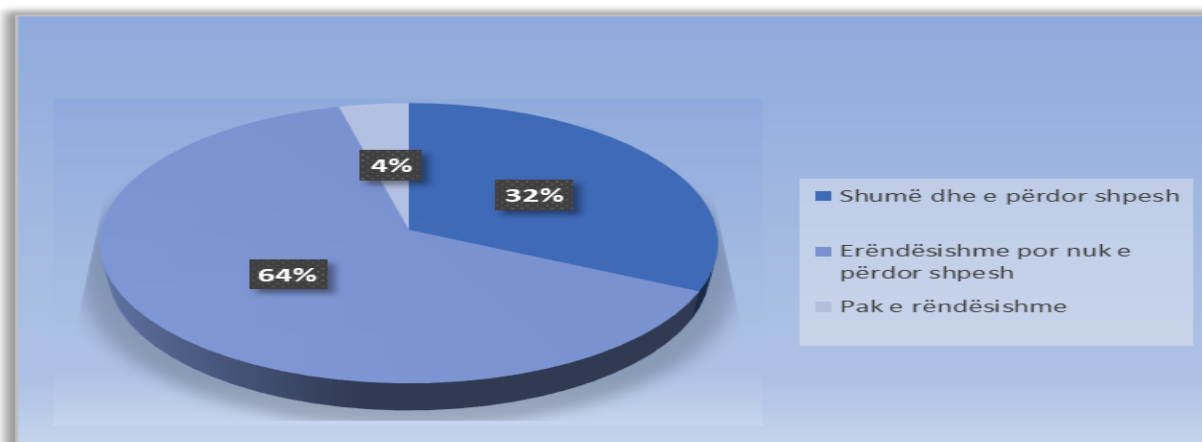


Figure 9

According to the table, specifically the graph for the question: How important is technology to you, and do you use it to gain knowledge in different fields?, the respondents' answers are as follows: 64% said It is important, but I don't use it often, 32% said It is very important and I use it often, and 4% said It is slightly important.

In conclusion, based on the data and research results, we find that the vast majority of students consider technology important but do not use it frequently. This helps us understand that students use technology only when necessary and not continuously or unnecessarily.

Table 10 — In general, how often do the students in your class use technology, and is there cooperation among you to gain knowledge in different fields?

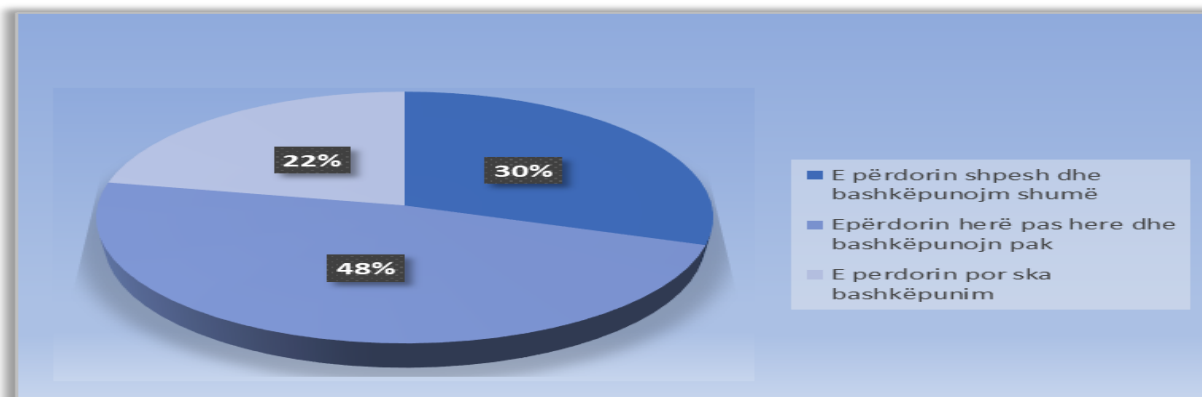


Figure.10

Based on the data from the graph of Question 10: “In general, how often do the students in your class use technology, and is there cooperation among you to gain knowledge in different fields?”,

the results show that:48% use technology occasionally and cooperate little,30% use it often and cooperate a lot, 22% use it but there is no cooperation.From the research results and the extracted values, 70% of the students use technology but either cooperate very little or do not cooperate at all. This is a relatively high percentage compared to only 30% of students who use technology and cooperate extensively.This helps us understand that students need to be more informed about the importance of cooperation, even when using technology. Cooperation can positively influence the acquisition of knowledge and lead to more satisfactory results in the learning process.

Conclusions

1.The topic we have chosen to discuss—the effects of digital technology on learning—will be quite challenging, as it requires research in the field of teaching and the use of technology in schools. It also enables us to interpret the results of technology use in schools, the adaptation of teaching methods to digital platforms, and the benefits that this phenomenon brings to the learning process.

2.Although schools in our country are not highly equipped with technology, efforts are being made to organize various trainings for raising awareness and promoting the use of digital technology in teaching, being aware that technology has reshaped education. Schools must be equipped with digital devices, especially to improve the quality of education.

3.Students must be trained in the use of technology, be informed about the advantages and disadvantages that this phenomenon brings, understand the importance of online research, and be trained to conduct scientific research rather than using technology for unproductive activities.

4.Students should clearly understand that the use of digital programs that offer ready-made answers, such as ChatGPT, creates dependence and harms critical thinking and natural learning.

5.Teachers and students should collaborate positively through technology and digital devices so that learning becomes more effective, and exploration in various fields leads to better academic outcomes.

Based on the reviewed literature and the general scope of our research in most schools of the Municipality of Drenas, we present the following recommendations:

Recommendation I:

Teachers should attend more frequent digital technology training programs so they can shift from simply transmitting knowledge to encouraging students to acquire information from various sources regarding the use of technology in general. This orientation should not be misunderstood; on the contrary, it should enrich the teacher's experience in using digital technology in teaching. Technology does not exclude the teacher from their role as an explainer of topics and concepts; instead, it requires them to adapt their methods to digital platforms in order to be clearer in explaining lessons to students.

Recommendation II:

Teachers and educational institutions should develop plans for dialogue with students so they can better understand their needs regarding technology and help them integrate more effectively into the learning process through technology.

Recommendation III:

Teachers should work diligently to raise students' awareness about the use of digital technology and programs, with the aim of ensuring better utilization of digital resources and technological information available to them.

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