

Students' insights on the impact of digital remote learning

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Abstract: *The main goal of this study was to analyse the various factors that influenced students' experiences during the period of digital remote learning (DRL). This involved exploring the challenges they faced, such as technical difficulties, limited personal interaction with instructors and peers, and issues with internet connectivity. Additionally, the study aimed to identify the aspects of DRL that students found convenient and beneficial. A 17-question survey was conducted with 147 students from seven academic specialties, yielding diverse insights into their experiences. The findings from this study strongly suggest that remote learning can serve as a viable alternative to traditional face-to-face instruction when implemented effectively. Nevertheless, the results also indicate that students exhibit ambivalence towards this teaching approach, likely stemming from the negative experiences they encountered during the transition. Many reported feeling a lack of direct engagement with educators and fellow students, as well as challenges associated with relying on technology for their learning. The results revealed that a blended method, which combines face-to-face teaching with online resources, was favoured by 72% of students. This hybrid model not only addresses the shortcomings of purely DRL but also enhances the educational experience by providing opportunities for in-person interaction and collaboration, thus fostering a more supportive learning environment. Institutions will benefit from implementing alternative DRL mode programs. Such initiatives will provide students with enhanced options and increased flexibility in achieving their academic objectives. By adopting these programs, institutions can better accommodate diverse learning preferences and extend support to a wider range of students.*

Keywords: Digital remote learning (DRL), Academic experiences, Students' insights.

1. Introduction

The Faculty of Technics and Technology (FTT) at Trakia University - Stara Zagora implemented digital remote learning (DRL) during the pandemic. In the aftermath of this transition, the project titled "*Post-Pandemic Learning Trends: Digital Online Teaching*" was launched to evaluate the effectiveness of the DRL approach. Throughout the COVID-19 pandemic, online learning has become a new experience for many students, teachers, and academics (Suwanto et al., 2021; Aristovnik et al., 2023; Baber 2023; Yang, 2023; Broadbent et al., 2023; Webster, 2024; Simamora & Nababan, 2025). The students shift to online education has presented various challenges. Educators had to adapt quickly and develop strategies to promote student participation and engagement in virtual classes. However, there are concerns about the effectiveness of online education as a long-

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term solution (Karim et al., 2025). Students have struggled with the transition to online learning, facing obstacles such as the need for independent study and limited access to reliable internet connectivity. Despite these challenges, many students have found online learning to be both cost-effective and time-efficient, allowing for easy access to study materials. However, the lack of interaction with peers and teachers, along with excessive screen time, has led to dissatisfaction among some students. Hence, while online learning has become necessary during the pandemic, it is essential to address the challenges and improve the online learning experience for both students and educators.

The goal of manuscript is to investigate the essential factors that significantly influence student motivation and engagement in educational settings, particularly within the context of DRL. The study seeks to identify students' preferences for custom-made learning methods. By illuminating these preferences, the research intends to equip educators and policymakers with actionable insights to project more innovative and responsive teaching strategies. Ultimately, the goal is to enhance student outcomes and cultivate an engaging and supportive educational environment that meets the diverse needs of all learners.

2. Method

2.1 Participants

Students from all academic programs at FTT-Yambol, encompassing both full-time and part-time formats, participated in a comprehensive survey concerning their experiences with distance learning during the pandemic. A total of 147 students across seven distinct specialties engaged in the research, comprising 62 full-time students who typically attend classes on a regular schedule, and 85 part-time students who often balance their studies with other commitments.

The demographic breakdown of the participants revealed a diverse group, with 38 women and 109 men contributing to the findings. The average age of respondents was 32.67 years, reflecting a mature cohort of learners. The ages varied significantly, ranging from 20 to 58 years, indicating that students from various life stages and backgrounds were involved in the survey. This diversity in age and experience provides valuable insights into the effectiveness and challenges of distance learning during an unprecedented time in education.

2.2 Method of preparation and analysis

A survey with the main research topics has been created and conducted during October 2023, winter semester. The inquiry was anonymous, consisting of 17 questions that cover the research topics of study: “*What/if bothered students during DRL*”; “*Classify, what/if was comfortable and convenient from DRL*”; “*What/if helps them to be motivated during DRL*”; and “*What/if discourages or disappoints them from DRL*”.

Table 1 lists several questions, and the article reports their results.

Table 1. Questions from the conducted survey

No	Question	Possible answers
1	Point out the positive aspects of online learning	<ul style="list-style-type: none"> - more free time – no need to travel; - saving money on travel and accommodation; - opportunity to review the lecture; - opportunity to be at work and listen to the lecture; - this way I am more focused and motivated; - availability of more online resources for self-study; - I can more easily combine: studying and resting, studying and working, studying and family commitments;
2	What is not accepted in online courses?	<ul style="list-style-type: none"> - isolation from the group I study with; - lack of direct contact with the teacher; - dependence on good quality internet and computer device; - difficulty motivating and organizing myself;
3	What was difficult for you during online learning?	<ul style="list-style-type: none"> - lack of good technology; - lack of good computer training; - I had no difficulties; - family commitments; - lack of change of environment, monotony, uniformity; - social isolation;
4	Are you a supporter of traditional face-to-face learning?	<ul style="list-style-type: none"> - Absolutely YES; - YES; - Rather YES than NO; - NO; - Absolutely NO;

Likert-type questions were employed in the survey to gauge participants' levels of agreement, disagreement, or feelings about specific statements. These questions are effective because they transform subjective opinions into structured, measurable data that researchers can analyze easily. The survey results were primarily examined using Excel. For group comparisons, the t-test and ANOVA (Analysis of Variance) were utilized as inferential statistical methods, focusing specifically on whether the observed differences between sample groups likely indicate real differences within the overall population. The trends identified in the data were illustrated with various charts and diagrams, which are presented and discussed in the article.

The research is a part of the scientific project titled "*Post-Pandemic Learning Trends: Digital Online Teaching*" conducted under contract No. 3 FTT/2023.

3. Results

3.1 Benefits of DRL According to Student Opinions

The survey results show that a significant percentage of students identified several advantages of DRL (Figure 1). One notable benefit mentioned by 21% of the students is that DRL provides them with more free time that allows them to engage in other activities or manage additional responsibilities since they do not need to spend time commuting to and from educational institutions.

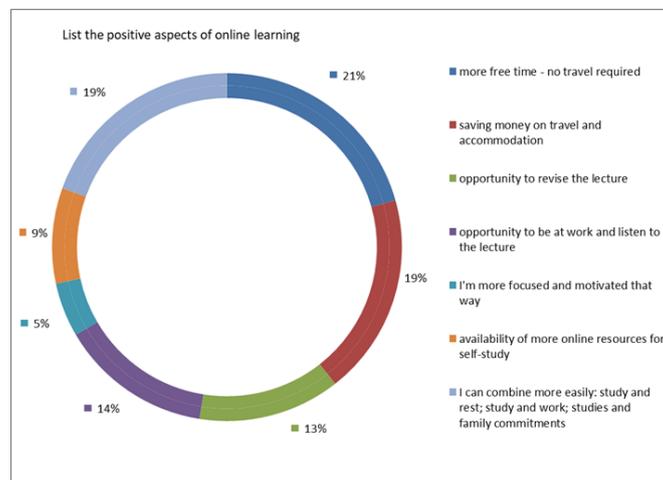


Figure 1. Positive aspects of DRL according to students' opinion

One advantage noted by 19% of the students is that remote learning is less expensive. This means they do not have to incur costs related to commuting, such as transportation fares or accommodations near the educational institution. As a result, remote learning can be a more cost-effective option for these students. Additionally, 19% of the students mentioned that remote learning allows them to easily balance their studies with other commitments, such as rest, work, or family responsibilities. This flexibility enables them to manage their time effectively and engage in their studies while also fulfilling other important obligations in their lives (Figure 1). Many other authors have reported similar findings. A survey of various academics found that remote learning has several positive aspects. Specifically, 21% of students indicated that it gives them extra free time and eliminates the need for travel (Dokuchyna, 2023). Moreover, 19% of students noted that remote learning is more cost-effective (Hadijaya & Wahyuni, 2023). Furthermore, another 19% stated that remote learning allows them to conveniently balance their studies with relaxation, work, or family responsibilities (Riega-Virú et al., 2023).

3.2 Negative perceptions of DRL according to Students' Opinion

According to the data presented in Figure 2, a significant majority of students—approximately 51% reported that they experienced no difficulties while undergoing DRL. However, around 17% of students stated facing challenges related to social isolation. Also, 11% encountered issues due to a lack of effective techniques, while another 11% felt hindered by an unchanging environment, which led to a sense of monotony. These findings emphasize the need for strategies to address the challenges students face in DRL, particularly those associated with social isolation and the development of effective learning techniques. It is essential to implement methods that can enhance students' success in DRL environments.

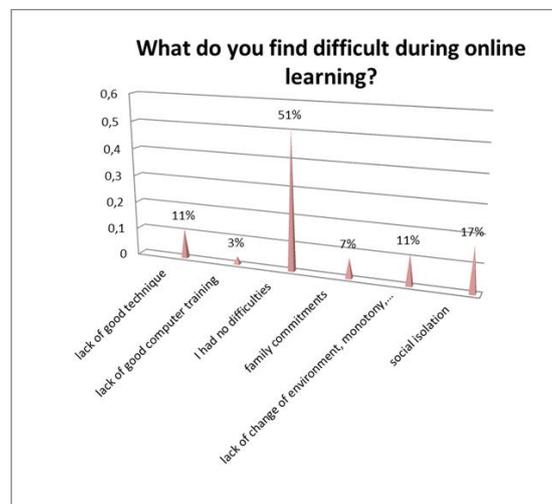


Figure 2. Negative aspects of DRL according to students' opinion

Other researchers have reported similar findings. For instance, about 51% of students indicated that they experienced no difficulties while undergoing DRL (Ding et al., 2022), as it was received in the current survey (Figure 2). However, around 17% of students reported facing social isolation as a challenge (Garingo & Cajucom, 2022), it also corresponded exactly to the same value of our investigation (Figure 2). The students encountered difficulties due to a lack of effective techniques, according Akyüz & Ergöl, (2022), is 11%, while another 11% felt hindered by a lack of changes in their environment, which led to feelings of monotony and uniformity (Yan et al., 2021). Those results overlap the obtained meaning of students' insights about DRL from our examination (Figure 2).

One major concern expressed by students regarding remote digital learning is the lack of direct contact with their teachers, with 45% of respondents indicating this issue in a recent survey. This absence of face-to-face interaction can make it challenging for students to understand the material, ask questions, and receive prompt feedback from their instructors. The 45% figure suggests that a substantial number of students feel this way, as illustrated in Figure 3.

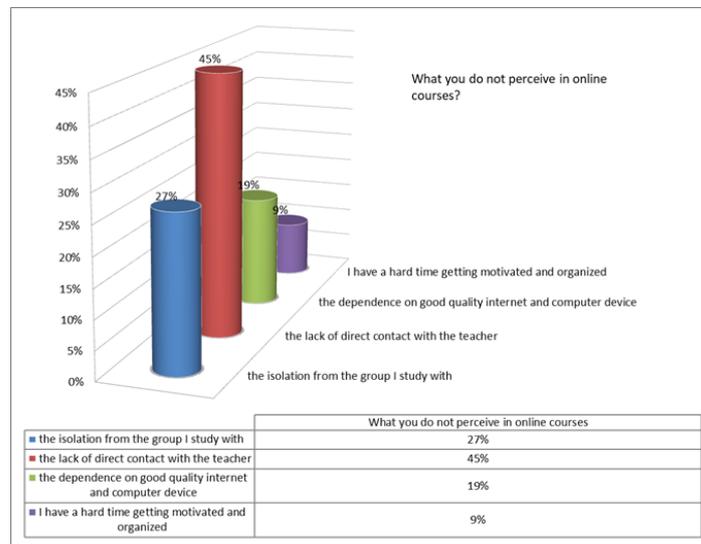


Figure 3. Students' opinions on negative perceptions of DRL

A significant negative aspect of Distance Remote Learning (DRL) is the feeling of isolation from peers, which was mentioned by 27% of students. This indicates that many students experience a sense of loneliness or disconnection during the learning process.

A significant number of students (19%) have expressed concerns about their reliance on good-quality internet and computer devices during remote digital learning. Many students feel frustrated by the fact that their learning experiences depend heavily on a reliable internet connection and suitable computer equipment. The lack of these resources can hinder their ability to fully participate in online classes, access learning materials, and complete assignments. Additionally, less than 9% of students reported difficulties with motivation and organization during remote digital learning (Figure 3). These challenges can negatively impact their engagement with the learning materials and their ability to meet course requirements.

Many studies have investigated the challenges students face with DRL. One of the primary concerns expressed by students is the lack of direct contact with their teachers. Approximately 45% of students have identified this absence of face-to-face interaction as a significant drawback (Lloyd, 2023). Without the benefit of in-person communication, students often experience difficulties in understanding instructions, encounter communication barriers, and feel disconnected from the learning process. Furthermore, 27% of students reported feeling disconnected from their peers, making it the second most common issue (Anggreyani & Dewi, 2023). This disconnection can result in feelings of isolation and loneliness, as students struggle to interact with their classmates and share their thoughts and experiences. The lack of peer interaction can also lead to decreased motivation and hinder the learning process. Around 19% of students identified the dependence on high-

quality internet and computer devices as a significant problem (Sujariati & Wanci, 2023). When these resources are unavailable, it becomes challenging for students to keep pace with the curriculum. Less than 9% of students cited difficulties in staying motivated and organized during remote learning (Kostina et al., 2023). The absence of a structured learning environment, combined with home distractions, can contribute to low motivation and poor organization.

These findings align with our own and highlight the importance of addressing the challenges associated with remote digital learning. To ensure the success of remote education, it is essential to enhance the interaction between teachers and students, reduce feelings of isolation, improve access to technology, and provide support for student motivation and organization.

3.3 Preferences for effective learning methods

Based on the responses gathered from student questionnaires, over 50% of students believe that combining face-to-face teaching with online resources is an effective learning method. This approach, known as blended learning, has been utilized for many years, even before the pandemic lockdown (see Figure 4).

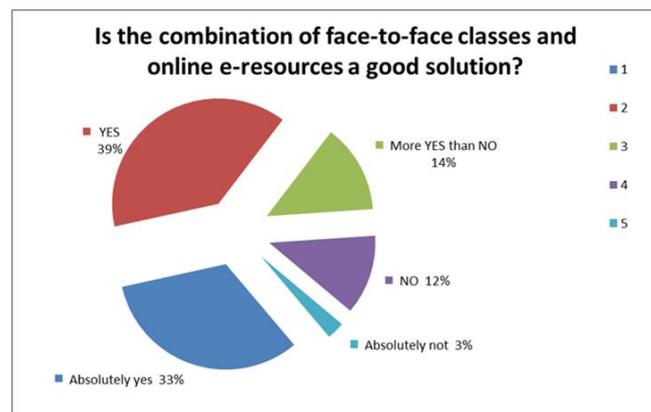


Figure 4. Students' opinion about methods of teaching and learning

According to recent research, remote learning has proven to be a highly effective alternative to traditional face-to-face learning. Studies have shown that about 72% of students prefer a combination of in-person teaching and online e-resources, also known as blended learning. This method of education has gained popularity among students seeking for a more comprehensive and engaging learning experience (Wahid, 2023; Zhang, 2023; Wahyuni et al., 2023). Blended learning has been in use for many years, before the pandemic lockdown (Indriani & Sulaiman, 2023). DRL empowers students to better manage their time, save money, and balance their academic studies with other obligations. By offering flexibility and convenience, DRL has emerged as a compelling option for students who seek to pursue their academic aims accommodating other responsibilities.

4. Discussions

DRL offers advantages, such as increased free time, cost-effectiveness, and the ability to balance studies with other commitments (Mawene et al., 2020; Mlodawski et al., 2022a). These findings highlight the potential benefits of DRL for students, including improved time management, financial savings, and greater flexibility (Ober & Kochmańska, 2024; Mlodawski et al., 2022b). Researchers believe that remote online learning could be a valuable part of high-quality education in the future, rather than just a temporary solution (Sanita et al. 2021).

Remote online learning has proven to be an effective way to maintain education during crises and wars, such as the ongoing war in Ukraine (Kuzheliev et al., 2023). Many students have expressed their satisfaction with the DRL during the COVID-19 pandemic (Kalniņa et al., 2023). However, there are some challenges associated with DRL, such as developing digital competencies, ensuring access to technology, and designing effective online learning materials (Wang, 2023).

Studies reveal that first-year students struggle more than fourth-year students to adapt and communicate in a new social environment during DRL (Rahim et al., 2024). Furthermore, sentiment analysis and topic modeling techniques have shown that e-learning during the pandemic has had some negative effects on individuals' emotions (Linnes et al., 2024). Nevertheless, the pandemic has prompted educators to teach remotely, leading to the largest distance-learning experiment in history and highlighting the potential for remote online learning to be a valuable component for delivering high-quality education in the future.

The experiences gained during the outbreak prompted a reevaluation of educational practices post-pandemic, emphasizing the necessity to adapt to the new normal and explore opportunities for improvement (Tonna et al., 2023; Svihus, 2024). The alteration to distance learning during the pandemic brought significant implications, leading to a need for changes in education worldwide (Popławska et al., 2023). Educators had to evolve their practices significantly to fit the new online instructional mode, highlighting the transformative nature of teaching and learning, which necessitates further investment in teacher education to facilitate remote teaching effectively. Karim et al. (2025) identify three primary challenges within online education system: digital accessibility issues, pedagogical difficulties, and concerns about assessment integrity. They propose practical solutions to address these problems, as improving infrastructure, developing faculty training programs, and implementing AI-enhanced assessment methods.

Considering the pandemic, educators from various institutions have acknowledged the vital role that online teaching has played in maintaining continuity in student learning. The transition to virtual classrooms has enabled the delivery of education despite restrictions on physical gatherings, allowing students to continue their studies safely from home. However, educators have also recognized its long-term limitations (Zhang & Gillespie, 2023; Tondeur et al., 2024). They have noted that DRL cannot fully replace the benefits of face-to-face interactions between students and teachers, which are essential for fostering meaningful connections,

providing personalized support, and building a sense of community. Despite these drawbacks, educators agree that online teaching has become an integral part of the educational landscape and will continue to be an important resource.

4. Conclusion

The research findings strongly suggest that remote learning can be an effective alternative to traditional face-to-face education. Combining in-person teaching with online resources proves effective for about 72% of students. However, many students neither fully embrace nor completely reject this blended approach, possibly due to negative experiences they encountered during remote learning -such as the lack of direct interaction with teachers and peers, dependence on a stable internet connection, and technical issues.

Despite its challenges, remote learning provides several benefits, such as improved time management, cost savings, and the ability to balance studies with other commitments. The flexibility and convenience of distance remote learning (DRL) make it an appealing choice for students aiming to achieve their academic goals while managing other responsibilities. These findings offer valuable insights into how DRL can enhance student outcomes and improve the overall educational experience.

Institutions are encouraged to explore and implement alternative DRL mode programs in order to provide students with enhanced options and flexibility for achieving their academic objectives.

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