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Trends in using Internet-based learning media for students during the COVID-19 pandemic

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ABSTRACT
The COVID-19 pandemic has led to a profound transformation in the global education system, forcing a sudden shift from face-to-face teaching to online learning. This study aims to understand how students have utilized technology for online learning during the pandemic, focusing on using the internet and smartphones and evaluating the effectiveness of various applications and platforms such as WhatsApp, Zoom, and Learning Management Systems (LMS). A descriptive quantitative research method was employed with a survey technique involving 220 students from Universitas Islam Syekh-Yusuf (UNIS) to gather data on their technology use activities. The findings indicate that UNIS students predominantly use the internet for learning and information-seeking, while smartphones are more frequently used for communication and entertainment. WhatsApp and Zoom are the most commonly used applications for online learning, reflecting a preference for familiar and easily accessible platforms. The study highlights the need for improved digital skills and technology access to support more effective learning. Recommendations include developing technology training for educators, providing better student resources, and integrating online learning models into long-term educational strategies to enhance education quality and flexibility.

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ABSTRAK
Pandemi COVID-19 telah mengakibatkan transformasi mendalam dalam sistem pendidikan global, memaksa pergeseran dari metode tatap muka ke pembelajaran daring secara mendadak. Penelitian ini bertujuan untuk memahami penggunaan teknologi oleh mahasiswa dalam konteks pembelajaran daring selama pandemi, dengan fokus pada pemanfaatan internet dan smartphone, serta efektivitas berbagai aplikasi dan platform seperti WhatsApp, Zoom, dan LMS. Metode penelitian kuantitatif deskriptif digunakan dengan teknik survei terhadap 220 mahasiswa Universitas Islam Syekh-Yusuf (UNIS) untuk mengumpulkan data mengenai aktivitas teknologi mereka. Hasil penelitian menunjukkan bahwa mahasiswa UNIS dominan menggunakan internet untuk belajar dan mencari informasi, sementara smartphone lebih sering digunakan untuk komunikasi dan hiburan. WhatsApp dan Zoom adalah aplikasi paling sering digunakan untuk pembelajaran daring, mencerminkan preferensi terhadap platform yang familiar dan mudah diakses. Temuan ini menyoroti perlunya peningkatan keterampilan digital dan akses teknologi untuk mendukung pembelajaran yang lebih efektif. Penelitian ini menyarankan pengembangan pelatihan teknologi untuk pengajar dan penyediaan sumber daya yang lebih baik bagi mahasiswa, serta integrasi model pembelajaran daring dalam strategi pendidikan jangka panjang untuk meningkatkan kualitas dan fleksibilitas pendidikan.
Kata Kunci: *COVID-19; pembelajaran jarak jauh; pembelajaran online*

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INTRODUCTION

The COVID-19 pandemic that began in early 2020 has changed almost all aspects of human life, including the global education system. The rapid spread of the virus and efforts to limit physical contact forced many countries to close schools and educational institutions to avoid crowds and reduce the risk of transmission. The impact of these closures is enormous, with millions of students worldwide suddenly losing access to face-to-face education and having to find alternative solutions to continue their learning. In response to school closures, many education systems worldwide suddenly shifted to online learning (Kaden, 2020; Manullang & Satria, 2020). This change involves transitioning from traditional face-to-face teaching to an entirely internet-based format. The sudden change due to the pandemic requires all parties to quickly adapt to new technologies and learning methods, which they may not have mastered before. This adaptation also includes using digital platforms to organize and deliver teaching materials and communicate virtually.

On March 24, 2020, *Menteri Pendidikan dan Kebudayaan Republik Indonesia* issued *Surat Edaran Nomor 4 Tahun 2020* regarding *Kebijakan Pendidikan dalam Situasi Darurat Penyebaran COVID-19*. This circular stipulates that the learning process is conducted from home through online or distance learning to provide a meaningful learning experience for students. The term "*daring*" is short for "*dalam jaringan*" as a substitute for the word "online" which is often used in internet technology. During a pandemic, people are advised to avoid crowds to prevent the broader spread of the virus. Distance learning is seen as a solution to minimize the spread of the virus. During the COVID-19 pandemic, Higher Education Institutions are faced with the challenges of the COVID-19 pandemic, which has changed the way and techniques of the teaching process. These changes require educational institutions to adapt to technology-based learning methods quickly. One of the most commonly used approaches is online learning, which utilizes digital platforms to support teaching and learning.

The *daring* learning process carried out by students is virtual face-to-face and through the Learning Management System (LMS). Virtual face-to-face activities can be done through video conferences, teleconferences, and/or group discussions on social media or messaging applications (Hacker et al., 2020; Nguyen et al., 2022). Meanwhile, LMS activities are online integrated learning management systems through applications. Learning activities in the LMS include registering and managing accounts, mastering materials, completing assignments, monitoring learning outcomes, engaging in discussion forums, consulting, and exams/assessments (Burrack & Thompson, 2021; Strakos et al., 2023). Examples of LMS that are widely used today include Kelas Maya Rumah Belajar, Google Classroom, Ruang Guru, Zenius, Edmodo, Moodle, Siajar LMS Seamolec, and so on (Hildayanti & Machrizzandi, 2021). Teachers can easily monitor student progress using LMS and provide regular feedback (Bradley, 2021; Kerimbayev et al., 2020). Learning using LMS makes students more flexible in accessing learning materials at any time according to their needs.

The profound changes in education due to the COVID-19 pandemic have required stakeholders to adapt how they teach and learn significantly. The massive implementation of *daring* learning requires adequate technological infrastructure and demands new readiness and skills from teachers and learners (Paliwal & Singh, 2021; Zou et al., 2021). Learning processes previously conducted in person in the classroom must transition to a digital format, where in-person interactions are replaced with communication through digital platforms. This transition creates additional challenges, especially for those less familiar with technology or with limited access to the necessary devices (Azevedo & Almeida, 2021). In addition, *daring* learning also requires the development of appropriate evaluation and assessment methods to maintain the quality and effectiveness of learning (Castro & Tumibay, 2021).

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To overcome these challenges, many educational institutions utilize various learning platforms and tools that can support the teaching and learning process effectively. In previous research, using an integrated LMS allows for more structured learning management, from material delivery to learning outcomes assessment (Bradley, 2021). However, based on other research, using platforms such as Google Classroom provides features that facilitate interaction between teachers and students and allow easier access to educational resources (Ríos-Lozada et al., 2022). Another study examined adults' readiness for *daring* learning in the Czech Republic and Latvia and how ICT policies and information society development strategies affect the development of their digital competencies. The study found no significant differences in *daring* learning readiness between the two countries, but the 18-29 age group in the Czech Republic was better prepared than the older age group (Mirke et al., 2019). These results underline the importance of adapting *daring* education strategies based on demographics and previous experience in *daring* courses.

In contrast to previous studies that focus on the use of e-learning platforms in general or *daring* learning readiness in various countries, this study specifically examines the patterns of digital technology use among students of Universitas Islam Syekh-Yusuf (UNIS) during the COVID-19 pandemic. While previous studies have examined *daring* learning readiness in the context of specific countries, this study will describe and analyze the patterns of digital technology use among students of Universitas Islam Syekh-Yusuf (UNIS) during the COVID-19 pandemic. This research will examine trends in internet use, computers, smartphones, and e-learning applications in learning and communicating. Using descriptive quantitative methods, this research illustrates how students utilize technology for academic, informational, and entertainment purposes, as well as to reveal shifts in technology usage patterns along with the adoption of e-learning and digital applications during the pandemic.

LITERATURE REVIEW

Transforming Learning

The COVID-19 pandemic has triggered significant changes in higher education around the world. As colleges and educational institutions are forced to close to prevent the spread of the virus, face-to-face teaching methods have shifted drastically towards online learning. Online learning was adopted as a response to the closure of universities due to social distancing and lockdown policies implemented in various countries (Babbar & Gupta, 2022). This sudden change requires all higher education stakeholders to adapt quickly in an uncertain situation. Transitioning from traditional teaching to internet-based formats presents new challenges and opportunities (Rizvi & Nabi, 2021). On the one hand, online learning allows students to continue attending lectures even if they cannot be physically present on campus. Technologies such as video conferencing platforms, LMS, and various educational applications have become important tools for distance learning (Camilleri & Camilleri, 2022). However, this sudden transition also causes various difficulties, especially for those who are less familiar with technology or do not have adequate access to devices and internet connectivity (Ahmed & Opoku, 2022).

For students, the biggest challenge in online learning is maintaining motivation and focus during lectures in a home environment often full of distractions. Many students have difficulty adjusting to this new learning format, especially regarding time management and understanding the material without direct guidance from the instructor (Wolters & Brady, 2021). Students with limited access to technology or those in remote areas face additional obstacles such as unstable internet connections and inadequate devices to take online courses (Clarin & Baluyos, 2022). Teachers also face significant challenges in this adaptation. Teachers must quickly master new technologies and adapt their teaching methods to the online learning format (Sims & Baker, 2021). In addition, teachers must find effective ways to maintain student interaction and engagement in the virtual lecture environment, which is often more difficult than face-to-face learning.

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Online Learning Model

Online learning, or internet-based learning, was a part of the modern educational landscape before the COVID-19 pandemic forced it to become a global norm. One of the learning theories relevant to online learning is constructivism theory. Constructivist theory emphasizes that learning is an active process where students construct their understanding and knowledge based on their experiences (Devi, 2019). Constructivism in online learning is applied through a more student-centered learning approach, where students are encouraged to explore materials, collaborate with their classmates virtually, and develop their understanding through practical and interactive experiences facilitated by technology (Sioukas, 2023; Yakar et al., 2020). Besides constructivism, distance learning theory (PJJ) is also highly relevant in online learning. Distance learning theory highlights the importance of time and space flexibility, allowing students to learn anytime and anywhere (Chandrawati *et al*., 2024; Dewanty & Farisya, 2023). Flexibility in online learning gives students the freedom to access learning materials according to their own learning pace.

Online learning models implemented before the pandemic include e-learning and blended learning. E-learning is an entirely internet-based learning approach, where all teaching materials, interactions, and assessments are conducted online. It allows for broad access and excellent flexibility, but it also presents challenges related to social isolation and students' need for high self-discipline (Butnaru et al., 2021; Xu & Xu, 2020). Meanwhile, blended learning combines face-to-face and online learning elements, offering the flexibility and convenience of online learning with the benefits of in-person interaction in a physical environment. The blended learning model is often used to utilize the advantages of digital technology while retaining the essential elements of face-to-face interaction (Islam et al., 2022). As technology evolves and the need for more flexible learning increases, these *online* learning models continue to evolve.

Online Learning Model

Learning in general includes various methods and approaches, both face-to-face and distance learning. As technology evolves, learning is shifting to digital formats that allow more flexible access to materials and interaction between teachers and students (Syafruddin, 2023). Internet-based learning is one of the main approaches, utilizing e-learning platforms and digital applications to support the teaching and learning process more efficiently and structured (Alenezi¸2020). Internet-based learning media support the teaching and learning process in the digital era, especially during the COVID-19 pandemic. Online learning platforms such as Google Classroom, Microsoft Teams, and Zoom have become the primary tools for conducting virtual classes (Anwar, 2022; Doshi et al., 2022; Talaksoru et al., 2024). Google Classroom provides an integrated environment for task management, feedback, and communication between teachers and students. Microsoft Teams offers collaboration features that allow students to work in groups and participate in live discussions. With its video conferencing feature, Zoom enables virtual face-to-face interaction, essential for maintaining student connectivity and engagement in distance learning.

Apps and study aids also contribute to supporting internet-based learning. Apps such as Kahoot and Quizlet provide interactive and fun ways to test knowledge and facilitate review of material (Yilmaz & Yasar, 2023). Kahoot, for example, offers game-based quizzes that increase student engagement, while Quizlet allows the creation of flashcards and practice questions that can be accessed at any time. Meanwhile, platforms such as edX and Coursera offer online courses from various universities and educational institutions worldwide, giving students access to high-quality learning materials and the opportunity to learn from experts in the field (Waks, 2019). LMS helps to create a more organized and personalized learning environment, allowing students to access materials, submit assignments, and interact with fellow students efficiently.

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METHODS

This descriptive quantitative research shows the trend or tendency of answers in the form of percentages. This quantitative research is used not to test hypotheses, but to show groups based on indicators or variables, which can be interpreted descriptively, the causes and factors of the problem (Liu, 2022). The subjects of this study are students with the characteristics set by the researcher, namely, students who experience long-distance lectures due to the impact of the COVID-19 pandemic on their studies, and then conclude. The data collection technique in this study used survey techniques, and the respondents were active students at UNIS, with sampling techniques using incidental sampling of students of Syekh-Yusuf Islamic University (UNIS). Incidental sampling is a technique in which respondents are selected by chance or based on availability during data collection, without specific planning or criteria. Hence, the number of respondents in this study was 220. The data analysis used is a descriptive analysis technique. The descriptive method in this study is used to analyze and describe data based on survey results, but without testing hypotheses.

RESULTS AND DISCUSSION

Results

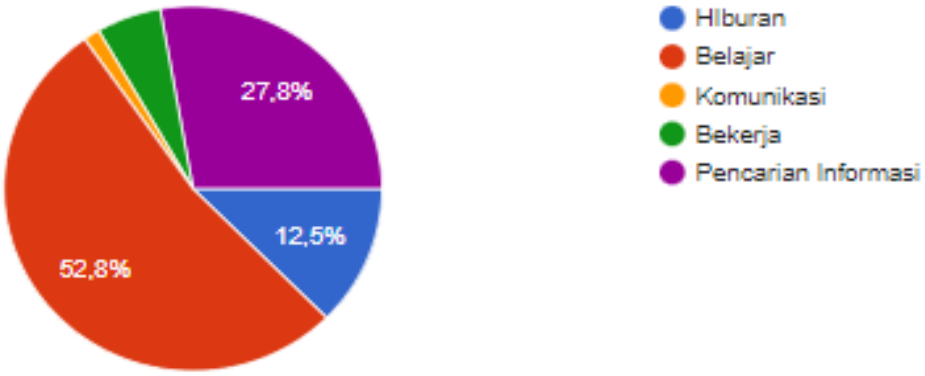

Figure 1. Computer Usage Based on the Purpose of Using the Internet
Source: Research 2024

Based on **Figure 1**, it can be seen that the majority of UNIS students use the internet mainly for learning purposes, reaching 52.8% of the total respondents. This reflects the importance of the internet as the primary source in supporting students' academic activities, especially in finding reference materials, doing assignments, and accessing online learning platforms. In addition, 27.8% of students use the internet to find information and entertainment, showing that the internet also plays an important role in supporting non-academic needs, such as enriching general knowledge and recreation. The use of the internet for work and communication has a smaller percentage, indicating that students tend to utilize the internet for activities that support learning and self-development rather than professional or social activities.

From the data presented, the Internet plays a crucial role in the academic life of UNIS students, where more than half of the respondents (52.8%) use it for learning purposes. The Internet is the primary source that students rely on in finding references, doing assignments, and attending online classes (Muthuprasad et al., 2021). Besides supporting academic activities, around 27.8% of students also use the internet for information and entertainment. Internet use is not only for education but also to enrich general knowledge and relaxation (Li, 2021; Pardini et al., 2022). However, internet use for work and communication is lower,

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which suggests that most students prioritize the internet to support their learning and self-development activities rather than for professional or social needs.

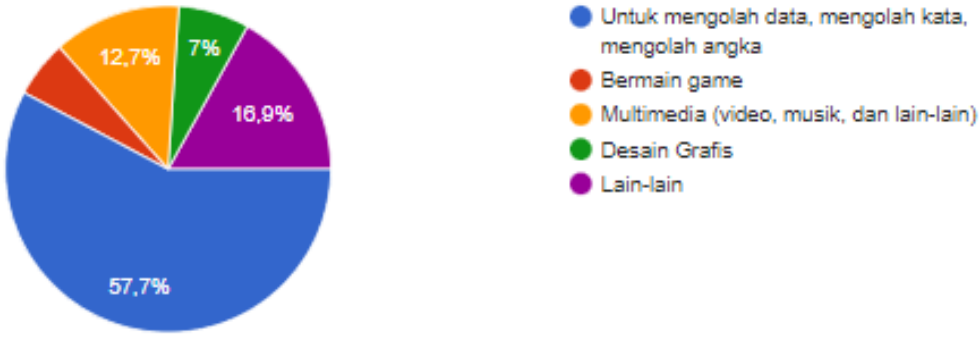

Figure 2. Computer Usage by Purpose: Using a Computer Without an Internet Connection
Source: Research 2024

Based on **Figure 2**, the use of computers by UNIS students without being connected to the internet is dominated by productive activities, such as processing data, processing words, and processing numbers, with a percentage of 57.7%. This shows that students utilize computers for academic and administrative tasks that require data processing software. Other activities, such as multimedia access, including watching videos and listening to music, were performed by 12.7% of respondents, reflecting that computers are also used as entertainment. Activities such as graphic design recorded 7%, indicating the utilization of computers for creative purposes. Meanwhile, only a small percentage of respondents used computers to play games, indicating that computers are more often used for academic and productivity purposes rather than entertainment.

The use of computers by UNIS students without connecting to the internet is mainly directed at productive activities, such as data, word, and number processing, with a percentage of 57.7%. Computers are the primary support tool for academic and administrative tasks requiring productivity software (Larshin *et al*., 2021). However, computers are also utilized as entertainment, with 12.7% of respondents using them to access multimedia such as watching videos and listening to music. In addition, 7% of respondents use computers for creative activities such as graphic design, indicating an interest in creative fields among students. The use of computers for gaming is very low, reinforcing the conclusion that students prioritize computers for productivity and academic needs rather than entertainment.

Table 1. Smartphone Usage Based on Usage

Usage Activity	Frequency	Percentage
Call	30	41,7%
SMS/Short Message	33	45,8%
Internet	67	93,1%
Video call	24	33,3%
others	28	38,9%

Source: Research 2024

Based on **Table 1**, the most frequent activity carried out by respondents is accessing the internet, with the frequency of use reaching 67 people, or 93.1% of the total respondents. This activity dominates compared to the use of smartphones for other activities. In comparison, the use of smartphones for calling was done

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by 30 respondents, equivalent to 41.7%, while SMS or short messages were used by 33 respondents, covering 45.8% of the total. The use of smartphones for video calls was the least, with only 24 respondents or 33.3%. Other activities also recorded a frequency of use of 28 respondents, which is 38.9%.

Using the internet through smartphones is the most dominant activity, with 93.1% of respondents accessing it regularly. This dominance highlights the role of the internet in respondents' daily lives. Internet access from smartphones can provide various services and information based on the needs of its users (Wang et al., 2020). Meanwhile, the use of smartphones for calling and texting is relatively lower, used by 41.7% and 45.8% of respondents, respectively, indicating that traditional communication, such as phone calls and text messages, is not as popular as internet access. Video calling, with only 33.3% of respondents doing so, shows that while this technology is becoming more common, its use is still limited. Other activities, which recorded a usage frequency of 38.9%, show variation in how respondents use their smartphones, but it remains below the frequency of internet access. This finding underscores the shifting prioritization of smartphone use from traditional communication functions to internet-based applications.

Table 2. Smartphone Usage Based on Its Use

Usage Activity	Frequency	Percentage
Entertainment	57	79,2%
Learning	56	77,8%
Communication	70	97,2%
Working	21	29,2%
Information search	57	79,2%

Source: Research 2024

Based on **Table 2**, the most frequent activity carried out by respondents is communication, with a frequency reaching 70 people or 97.2% of the total respondents. This activity is much higher than the use of smartphones for other activities. In addition, the use of smartphones for entertainment and information searches was carried out by 57 respondents, each covering 79.2% of the total respondents. Learning activities are also relatively high, with 56 respondents, or 77.8%, using them for this purpose. In contrast, using smartphones for work is the lowest, with only 21 respondents, or 29.2%, doing so. This data illustrates how respondents use smartphones in various contexts.

Communication is the main activity carried out by 97.2% of respondents, indicating that smartphones function primarily as a communication tool in their daily lives The use of smartphones for entertainment and information seeking is also very significant, each carried out by 79.2% of respondents, indicating that smartphones are not only used for communication but also as a source of entertainment and information. Learning activities involving 77.8% of respondents indicate that smartphones also function as an important educational tool. In contrast, using smartphones for work is relatively low, with only 29.2% of respondents doing so. Although smartphones can support various activities, their use for professional purposes is still limited compared to other functions (Bauer et al., 2020). These data reflect the multifunctional role of smartphones in respondents' daily lives, with the primary focus on communication and entertainment. At the same time, their use for work purposes is still less developed.

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Table 3. Smartphone Activities When Connected to the Internet

Activity	Frequency	Percentage
Communication via the internet	67	93,3%
Web browsing	65	90,3%
Uploading or saving data	49	68,1%
Using learning management applications	31	43,1%
Uploading or reading ebooks	34	47,2%
Creating computer programs	5	6,9%
Transacting online for buying and selling	32	44,4%
Playing games	38	52,8%
Searching, downloading, and installing applications	30	41,7%
Streaming videos, music, or radio	62	86,1%

Source: Research 2024

Based on **Table 3**, the most frequent activity carried out by respondents is communication via the internet, with a frequency reaching 67 people or 93.3% of the total respondents. This activity is followed by web browsing, which is carried out by 65 respondents, covering 90.3% of the total. Streaming video, music, or radio is also an everyday activity, with 62 respondents, or 86.1%, involved. The use of smartphones to upload or store data by 49 respondents, equivalent to 68.1% of the total. In addition, creating computer programs is the least frequently carried out activity, with only five respondents, or 6.9%, involved. Also, creating computer programs is the least frequently carried out activity, with only five respondents, or 6.9%, involved. Other activities include reading or uploading ebooks, which is carried out by 34 respondents or 47.2%, and online buying and selling transactions by 32 respondents or 44.4%. The use of learning management applications is registered by 31 respondents or 43.1%, while searching, downloading, or installing applications involves 30 respondents or 41.7%. Lastly, 38 respondents played games, covering 52.8% of the total.

Internet communication was the most common activity among respondents, with 93.3% engaging in this activity, confirming that smartphones are essential to online interactions. Web browsing, which was done by 90.3% of respondents, was also a primary activity, indicating a high interest in exploring web content. Streaming video, music, or radio involved 86.1% of respondents, indicating that digital entertainment is a significant use of smartphones. Although uploading or storing data was used by 68.1% of respondents, activities such as creating computer programs were infrequent, with only 6.9% of respondents involved, indicating that the use of smartphones for software development is still limited. Activities like reading or uploading ebooks, making online buying and selling transactions, and using learning management applications show diversity in smartphone use. (Chen et al., 2019; Hossain et al., 2020). Based on **Table 3**, searching and downloading applications and playing games also contribute to diverse usage patterns. This data reflects that smartphones are widely used for communication, entertainment, and everyday activities, while higher technical and productivity activities are less common.

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Table 4. Utilization of e-learning based on the Use of Online Applications for Learning

Activity	Frequency	Percentage
WhatsApp	67	93,3%
Zoom	65	90,3%
Skype	49	68,1%
Edmodo	31	43,1%
e-learning UNIS	34	47,2%

Source: Research 2024

Based on **Table 4**, the most frequently used online application for learning is WhatsApp, with a frequency of use reaching 67 people or 93.3% of the total respondents. The Zoom application is also widely used, with 65 respondents, or 90.3%, involved. Skype is an application used by 49 respondents, covering 68.1% of the total. Meanwhile, 31 respondents, or 43.1%, used the Edmodo and UNIS e-learning applications, and 34 respondents, or 47.2%, respectively. These data show variations in community groups and utilization of various online applications for learning purposes among respondents.

WhatsApp is the most dominant online application used for learning, with 93.3% of respondents relying on it, perhaps due to the ease of communicating and sharing materials directly. Zoom is also a very popular application with 90.3% of respondents using it, indicating its important role in online meetings and virtual classes. Skype, with 68.1% of users, is still relevant even though it is not as popular as WhatsApp or Zoom. Virtual meetings such as Zoom and Skype contribute to video communication for educational purposes (Correia et al., 2020). Meanwhile, education-specific applications such as Edmodo and UNIS e-learning are used by 43.1% and 47.2% of respondents, respectively, indicating that while there is adoption for platforms specifically designed for learning, they are still less dominant than general communication applications. This data underlines that although various applications are available to support learning, general communication applications such as WhatsApp and Zoom are more widely used than platforms specifically designed for education.

Discussion

The COVID-19 pandemic has triggered a significant transformation in the way students use technology to learn and interact. Data shows that UNIS students use the internet primarily for learning and information searching, and most use it for these purposes. These data reflect a significant shift towards using digital technologies as the primary source of academic information. Digital technology makes it easier to search for information quickly (Vargo et al., 2021). Based on the results of this study, computers are used productively, with most students using them to process data, words, and numbers, highlighting the importance of these devices in academic and administrative activities. Computer devices cannot be replaced by other devices in processing data, words, and numbers (Bansal & Kumar, 2020). On the other hand, smartphones dominate internet usage with 93.1% of respondents accessing them for this purpose, indicating that smartphones are used more often to surf the internet than for direct communication, such as calling or video calling. Communication activity via smartphones reached 97.2%, reflecting the important role of communication in students' lives, although use for work was the lowest, at only 29.2%. When connected to the internet, students use smartphones more for communication, web browsing, and media streaming, demonstrating the multifunctionality of these devices in supporting various activities. The use of smartphones is not just for communication. Nowadays, smartphones can represent many gadgets due to technological advances (Atas & Çelik, 2019).

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E-learning, WhatsApp, and Zoom are the most frequently used applications, with 93.3% and 90.3% of respondents using these applications respectively for learning. This indicates that familiar and easily accessible applications are preferred for online academic activities. Meanwhile, using applications such as Skype, Edmodo, and UNIS e-learning also reflects the diversity in using e-learning tools. Overall, this data shows that digital technology, especially smartphones and e-learning applications, supports effective learning during the pandemic, emphasizing the need for educational institutions to continue adapting to technological developments and student needs. Utilizing e-learning during a pandemic can be a solution in learning because the features offered make it easier and shorten the time for processing grades (Stecuła & Wolniak, 2022).

Data shows a significant shift in technology usage patterns among college students. Using the internet as a primary tool for learning and searching for information shows a rapid adaptation to online learning. (Dhawan, 2020). The pandemic has accelerated the adoption of digital technologies, making students increasingly dependent on tools such as smartphones and e-learning apps to meet academic needs (Stecuła & Wolniak, 2022). Using computers without an internet connection to process data and perform document-based tasks emphasizes the importance of basic technological skills in supporting academic productivity. The heavy reliance on communication apps like WhatsApp and Zoom for online learning also shows how students seek more efficient and familiar ways to interact and collaborate virtually. Meanwhile, the role of applications such as Skype, Edmodo, and UNIS e-learning shows that various platforms have a special place in supporting technology-based learning. Given these trends, it is clear that educational institutions must continuously evaluate and adapt to evolving technologies to ensure that the learning methods implemented meet academic needs and leverage the full potential of the digital tools available.

CONCLUSION

This study shows that there has been a significant shift in technology usage patterns among students, especially in terms of adapting to *online* learning. This shift reflects how digital technologies, such as the internet, computers, and smartphones, are becoming increasingly integral to everyday academic activities. Online learning can offer flexibility and innovation in education, allowing students to access materials anytime and anywhere, and facilitating interaction through digital platforms. Digital platforms such as Google Classroom and Zoom have become essential tools in the learning process, allowing students and teachers to stay connected and engaged in academic activities even when they cannot meet physically.

The implications of these findings suggest that while online learning has been an effective alternative during the pandemic, there is an urgent need for digital skills enhancement for teachers and students and increased access to technology to ensure educational equity. Suggestions that can be given include developing further training for teachers to improve their ability to use online learning technology, as well as providing better technology resources for students, especially in remote areas. In addition, educational institutions should consider integrating online learning models as part of a long-term education strategy, balancing face-to-face and online learning to improve the quality and flexibility of education.

AUTHOR'S NOTE

The author declares that there is no conflict of interest regarding the publication of this article and confirms that the data and contents of the article are free from plagiarism.

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