Research Article

Reviewing the Effectiveness of Educational Technologies in Enhancing Student Learning Outcomes

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Abstract. Technological developments have helped human life in various fields, including education. In practice, technology has a positive influence on student learning outcomes. This research will be carried out to see how effective the use of technology is for student learning outcomes. This research was conducted using a descriptive qualitative approach. The data used in this study comes from various research results and previous studies, which still have relevance to the content of this research. The study results then found that technology can assist educators in providing material to students. Then students can also be helped to understand the material delivered by the teacher through technology. Various uses of this technology prove the effectiveness of the use of technology to improve student learning outcomes. Therefore, educators, such as teachers, must use the right technology to carry out the learning process.

Keywords: Effectiveness, Technology, Learning Outcomes, Students.

A.   INTRODUCTION

In today's life, technology has a very important role. Almost all aspects of life use technology, from work, communication, and entertainment, to education. Technological developments that continue to progress also impact globalization on society, changing people's thoughts and views in a broader direction. However, the rapid development of technology also raises several challenges for education, especially in Indonesia (Tugun et al., 2020).

Along with the rapid development of technology, educational technology has also become one of the components used for the learning process. This educational technology comprises various components, such as media, tools, methods, etc. Educational technology facilities are very important in educational institutes because they can support the learning process to achieve a learning goal, namely developing students' potential (Miranda et al., 2021).

However, in Indonesia, educational technology use is still lagging compared to developed countries. This is caused by a lack of understanding of educators related to the use of educational technology. Many educators still use monotonous learning media and methods, which causes students to be less interested in learning and easily bored. As a result, students will not understand the information educators convey (Retnawati, 2019).

To overcome this, an educator must have educational skills to achieve educational goals. The skills of an educator can be obtained from participating in soft skill training and seminars and studying knowledge related to the application of appropriate media, methods, and strategies applied to the learning process. Educators can transfer knowledge to students, and educational technology can be effectively applied to increase student understanding (Crawford et al., 2020).

Awareness of the importance of educational technology in education must continue to be increased. In the increasingly rapid development of technology, educational institutions must continue adapting to new technologies and utilize them in the learning process. Educators must also keep abreast of technological developments and learn how to apply educational technology appropriately so that students can continue to be motivated and study well. In this way, educational technology can improve Indonesia's education quality (Chen et al., 2021).

Appropriate educational technology can facilitate students to understand learning material more easily and pleasantly. Educational technology can also overcome problems encountered in the learning process, such as the problem of lack of interest in learning or student boredom. In addition, educational technology can also help improve student learning outcomes (Andriyani & Suniasih, 2021).

For example, interactive learning media can help increase students' understanding of learning material. In interactive learning media, students can interact directly with learning materials by clicking on images or text on the screen. This can make students more interested and enthusiastic in learning, so the learning outcomes are even better.

Educational technology can also help broaden students' horizons. In today's digital era, information and knowledge can be accessed easily via the internet. Learners can use educational technology to seek additional information and knowledge relevant to learning materials. Thus, students can have broader and deeper insights into learning material. However, using educational technology must also be accompanied by proper supervision and control. Excessive or inappropriate use of educational technology can harm student learning outcomes. Therefore, there needs to be proper control over the use of educational technology in the learning process (Szymkowiak et al., 2021).

Through the brief explanation above, the researcher then intends to see how the effectiveness of the use of educational technology in improving student learning outcomes.

B. LITERATURE REVIEW
1. Effectiveness

Efficacy is typically defined as the degree to which operative and operational objectives are met. Effectiveness is the degree to which organizational objectives are attained. Effectiveness is the quality of the job and the amount to which a person produces the intended product. This can be interpreted if a job can be carried out according to plan, it can be said to be effective without regard to time, effort, and others. At the same time, the effectiveness of the implementation of regional autonomy policies is the extent to which local government activities can carry out, realize, and improve services to the community, decision-making community participation. Implementation of development and settlement of various problems in implementing regional autonomy (Wolters & Brady, 2020).

Sondang P. Siagian states that effectiveness is using resources, facilities, and infrastructure in a certain amount that is purposefully determined beforehand to generate various commodities for the services of its activities. Effectiveness reflects success in terms of whether or not the goals that have been set are attained. If the outcomes of activities are moving closer to the intended outcome, this indicates greater efficacy (Karubaba, 2022).

Effectiveness, according to Ravianto, is the measure of how well a job is performed. This indicates that a task is deemed successful if it is accomplished according to plan in terms of time, money, and quality. According to Permendagri No 59 of 2007, effectiveness is the achievement of defined program objectives, as measured by comparing outputs and outcomes. In contrast, effectiveness refers to the achievement of results, or, in simpler terms, it can be stated as follows: local government is effective when its goals can be fulfilled in accordance with its intended needs (Priscilla et al., 2022).

Effectiveness, according to Mardiasmo, is attaining expected or desired goals by completing work according to a set strategy. When the success or failure of an organization is determined by the achievement of its goals, it can be argued that the organization has been operating successfully. Effectiveness can be interpreted as an organizational objective based on the previous opinion. Effectiveness focuses on the achievement of an organization's objectives; if these objectives are met, the organization can be considered effective (Digdowiseiso, 2022).

According to Rohmawati, the effectiveness of learning is a measure of the success of a process of interaction between students and between students and teachers in educational settings to attain learning objectives. Effective learning can be observed in student actions during learning, student responses to learning, and concept mastering. To achieve an effective and efficient learning concept, there must be a reciprocal relationship between students and teachers in which they work together to achieve a common goal. In addition, the concept must be adapted to the conditions of the school environment, facilities and infrastructure, and learning media that are required to facilitate all aspects of student development. Hence, learning effectiveness can be understood as a measurement of the success of a learning process involving students and students or students and teachers in fulfilling learning objectives (Rahmawati et al., 2019).

On the basis of the preceding explanations, it is possible to conclude that learning effectiveness is the level of success obtained by a specific learning method in relation to the intended learning objectives.

2. Education Technology

The Association of Education Communication & Technology defined instructional technology as follows: "instructional technology is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning". Concerning this, the definition according to Hackbarth, Educational Technology is a multidimensional concept that includes: 1) a systematic process that involves the application of knowledge to find solutions that can be used in solving learning and learning problems; 2) products such as textbooks, audio programs, television programs, computer software, and others; 3) a profession consisting of various job categories; and 4) is a specific part of education (Pettersson, 2021).

In addition to the several definitions above, AECT has also put forward a definition of educational technology which is translated into the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. This definition contains several keywords: study, practice ethics, facilitation, learning, improvement, creation, utilization, management, technology, processes, and resources (Butar-butar et al., 2023).

To support the achievement of educational goals, the competency development of students must be adjusted to the needs, potential, developments, and environmental demands of students. In the context of education more generally, or just PBM, educational technology is the development, application, and assessment of systems, techniques, and tools to improve human learning quality. Thus, the aspects include theoretical considerations: research results, technical devices and equipment or hardware, and software or software. These aspects function to design and carry out educational assessments with a systematic approach. So the software is in the form of analyzing and designing sequences or learning steps based on the goals to be achieved with a suitable presentation method and success assessment. While the hardwear is teaching aids, audio-visual aids, or instructional aids such as TV, radio, film, projector, overhead projector, videotape recorder, computer, etc. (Zhang et al., 2020).

According to a different viewpoint, educational technology is the research and practice of facilitating learning and enhancing performance through the design, implementation, and management of suitable technological processes and resources. Educational technology is typically related with learning and learning theory. If learning and learning theory covers processes and systems involved in learning and learning, educational technology provides additional systems used to develop human capacities (Kutieshat & Farmanesh, 2022).

According to some, educational technology is the study and application of behavioral science and learning theory, as well as a systems-based approach to analyzing, designing, developing, implementing, evaluating, and regulating technology to solve learning challenges. In this instance, it is vital to employ a combination of human and non-human resources to increase its effectiveness (Michie et al., 2020).

In order to solve difficulties affecting all facets of human learning, educational technology is utilized as a sophisticated and unified process. In instructional technology, problem-solving takes the shape of all learning resources produced and selected or employed for educational objectives. These learning resources include messages, people, materials, equipment, methodologies, and environmental settings (Sweller, 2020).

So the conclusion is that conceptually educational technology is defined as theory and practice in the design, development, utilization, management, assessment, and research of processes, resources, and systems for learning. This definition implies that there are components in learning: theory and practice; design, development, utilization, management, assessment, and research; processes, resources, and systems; and study. So, the term educational technology is broader in scope than learning technology. Educational technology includes other systems used to develop human capabilities (Di Vaio et al., 2023).

3. Learning Outcomes

Because there is a desired outcome, the process of learning occurs. Learning outcomes represent the desired aim. The learning outcomes must demonstrate a sedentary, functional, positive, and self-aware shift in behavior. The manifestation of learning outcomes will always be associated with evaluation activities. In order to successfully evaluate learning processes and outcomes, strategies and procedures for learning evaluation are required (Pangaribuan et al., 2022).

According to Sri Anitah, learning outcomes related to the ability to think critically and scientifically in elementary school students can be studied based on the following:
a. The ability to read, observe, and listen to what is explained or informed.
b. The ability to identify or make several (sub-sub) questions based on the substance read, observed, and heard.
c. Ability to organize identification results and examine from the point of similarities and differences.
d. Ability to conduct a thorough study (Cain, 2020).

According to H.M. Surya, learning outcomes were characterized by changes in overall behavior. Aspects of cognitive, connotative, affective, and physical behavior may be modified as a result of learning. Partial learning, as opposed to complete learning, refers to the modification of only one or two components of behavior.

Learning outcomes are the skills acquired by students after participating in learning activities. Youngsters who are effective in learning achieve their educational or learning objectives. Meanwhile, according to Usman, the learning outcomes of changes in behavior in individuals are due to the interaction between one individual and another individual and between the individual and the environment. Learning outcomes are the talents that individuals acquire as a result of the learning process, which can lead to improvements in students'

behavior, knowledge, understanding, attitudes, and capacities. One measure of the learning process is the learning outcomes. Learning outcomes are alterations in student behavior that result from participation in educational activities (Saihu, 2020).

The success or failure of a person in learning is caused by factors that influence the achievement of learning outcomes, namely those that come from within the students who are learning (internal factors) and some that come from outside the students who are learning (external factors) (Metekohy et al., 2022).

According to Slameto, the factors that influence learning are:
a. Internal factors consist of physical factors and psychological factors.
b. External factors consist of family factors, school factors, and community factors.
   While the main factors that influence student learning outcomes include:
a. Internal factors, namely the physical and spiritual conditions/states of students.
b. External factors, namely environmental conditions around students, for example, environmental factors.
c. The learning approach factor is a type of student learning effort that includes strategies and methods to carry out activities to study learning materials (Akrim, 2020).

Factors that influence learning outcomes include students' physical and spiritual factors, this is related to student health problems, both their physical condition in general, and environmental factors also greatly influence. Student abilities influence 70% of student learning outcomes at school and 30% by the environment (Zhao et al., 2021).

C. METODE

This research will be conducted using qualitative methods. The research data will be analyzed through a descriptive approach. The data sources used in this study come from different research results that still have relevance to the discussion of the use of technology in education. The research data that the next researcher successfully collected will soon be processed so that the results of this research can be found.

D. RESULT AND DISCUSSION

1. Information and Communication Technology Functions in Learning

Information and communication technology (ICT) is a phenomenon that has influenced human life in various fields, including the field of education. ICT has four main functions that are very important in learning activities, namely as a tool, knowledge, materials, and tools for the learning process, as well as minimizing the gap in the mastery of the latest technology.

a. The first function of ICT as a tool is to help teachers or students assist learning. For example, ICT is used to manage words, manage numbers, create graphic elements, create databases, create administrative programs for students, teachers, and staff, personnel data, finance, and so on. ICT can also be used as an interactive and fun learning medium.

b. The second function of ICT as science is very important for students to master. Currently, ICT has become local content in both public and private schools. This is because ICT is part of a scientific discipline that students must master to compete in the digital era.

c. The third function of ICT as a material and tool for the learning process is an innovation that is very helpful in teaching. ICT is interpreted as a learning material and a tool to master a computer-assisted competency. In this case, the computer has been programmed so that students are guided in stages using the principle of complete learning to master competence. The position of ICT, in this case, is no different from that of a teacher who functions as a facilitator, transmitter, motivator, and evaluator.

d. The fourth function of ICT is to minimize the gap in the mastery of the latest technology, especially in education. The implementation of ICT-based education has at least two advantages. First, as a motivation for educational implementers (including teachers) to be more appreciative and innovative. Second, provide broad opportunities for educators and students to take advantage of every potential to obtain unlimited sources of information.

However, like other technologies, ICT has a negative impact, especially from a moral perspective. ICT can be a medium for disseminating various behaviors that violate religious and social norms. Therefore, it is important to use ICT wisely and pay attention to the ethics of its use. Even though there are negative impacts of information and communication technology, we cannot avoid the development of this technology. Instead, we need to learn how to use technology wisely and responsibly. ICT-based education can help teach students how to use technology properly so that they can avoid the negative effects of technology and make optimal use of its benefits.

Information and communication technology can also increase the effectiveness of learning. By using ICT, teachers can provide learning materials that are more interesting and interactive so that students are more interested and motivated to learn. In addition, technology can also assist in conducting learning evaluations, for example, by using applications to create and check student assignments.

In the current era of globalization, the ability to use information and communication technology is a must. These technologies can help us communicate and interact with people from various countries and cultures. In addition, technology can also help us access unlimited information so that we can broaden our knowledge and insights.

It can be said that information and communication technology do have positive and negative impacts that need attention. However, as a society living in the digital era, we cannot avoid using this technology. Therefore, we need to learn how to use technology wisely and responsibly and develop ICT-based education to increase learning effectiveness and help students master skills in using technology optimally.

2. The Role of Technology in Learning

In increasingly rapid times, both public and private schools have begun to rearrange their education systems to keep up with the flow of globalization. School programs with various majors and school statuses, such as SSN, excellent, model, international, accelerated, and qualified infrastructure, are also offered to the public. However, quality human resources are very important for the education system to run well. Teachers who are qualified and have good management skills will be able to create educational designs that are innovative and not stuttering about educational developments.

One thing that cannot be separated from educational innovation in educational technology. The two are interrelated and form an inseparable unit. Educational technology exists to increase effectiveness and efficiency in the teaching and learning process. Therefore, educational technology must be understood as an attempt to solve problems encountered in teaching and learning. In this context, educational technology is also seen as a product and process that can facilitate the learning process and provide a source of information that fits educational needs.

Educational technology is defined as the ethical study and practice of facilitating learning and improving performance through the creation, utilization, and management of technological resources appropriately. This field of applied science is interested in facilitating the learning process and improving the quality of learning through properly designing and managing technological resources. Therefore, educational technology is a field of applied

science that combines several disciplines to facilitate the learning process, improve the quality of learning, and improve student performance. In this way, educational technology can help improve the quality of education and prepare young people to face increasingly complex future challenges.

Technology can facilitate collaborative relationships between teachers, lecturers, students, and learning resources. In this digital era, various online applications can be used to communicate, such as Skype, Yahoo Messenger, Facebook, Zoom, Google Meet, and other networks. This application allows teachers and students to communicate in real-time through group discussions, questions and answers, or mentoring.

Technology can also provide a complex, realistic, and secure problem-solving environment. Hypermedia and software that can be used to create projects are examples of technologies that can facilitate the creation of such environments. In this environment, students can work together to complete a given task or project and get a more meaningful learning experience.

Technology can also facilitate the active formation of meaning via the internet to search for the latest research, photos, videos, etc. In this case, students not only enjoy tracing but can also learn and understand the material being studied and know contexts that are easier to understand. Technology allows students to access learning resources independently to learn more effectively and efficiently.

Educational technology has also played a very important role in the educational revolution, especially in the 21st-century educational revolution and the fourth revolution, called education 4.0. At this stage, the teacher's function is no longer central in the learning process but has become student-centered, where the teacher is only a facilitator for providing student's learning needs to prepare learning resources and media. This requires teachers to utilize technology to provide effective and efficient learning so that students can achieve optimal performance.

3. The Effectiveness of Technology for Student Learning Outcomes

Technology has significantly impacted education and opened up many opportunities to improve student learning outcomes. This can be seen from the various educational technologies, such as learning software, applications, video conferencing, and e-learning. Some of the advantages of using technology that have the potential to improve student learning outcomes include the following:

a. Easier and Faster Access to Information

Technology has made access to information easier and faster. Students can access the latest information in a short time via the internet. This allows students to obtain information more quickly and use it as their learning resource.

b. More Interactive and Interesting Learning

Technology has also made learning more interactive and engaging. In the classroom, teachers can use technology such as multimedia and presentations to enrich students' learning experiences. In addition, many learning applications and software are designed to make learning more interesting and interactive.

c. Use of Technology in Distance Learning

Technology is also enabling more effective distance learning. In a pandemic situation like today, students can study from home through technology such as video conferencing and e-learning. This technology lets students stay connected with their teachers and classmates while learning remotely.

d. Learning that Can be Adapted to Student Needs

Technology also enables learning that can be adapted to the needs of students. In conventional learning, adjusting each student's speed and difficulty level is difficult. However, with technology, students can learn according to the level and pace that suits their abilities.

e. Easier and Accurate Learning Evaluation

Technology also facilitates easier and more accurate evaluation of learning. Teachers can use apps and software to measure student progress and provide more accurate and detailed feedback. With more accurate evaluations, teachers can better understand students' needs and help them achieve better learning outcomes.

The use of technology in teaching is very effective because in an era like the students are also familiar with technology, so children will also be more interested if learning can use technology, of course, children will be curious and pay attention to the material presented by educators. The technology used in face-to-face learning uses platforms such as computers. Meanwhile, online educational technology uses platforms such as Google Classroom, Google Meet, and Zoom. The use of technology can add to a broad understanding or seek information other than just books and print media. In addition, technology can also improve learning abilities, and this happens because the information on the internet is more updated so that students will more easily access the latest information related to learning under the supervision of educators. Technology can also increase students' interest in learning because information and easy access can make students more interested in carrying out learning.

Although technology provides many advantages in improving student learning outcomes, technology also has some disadvantages. One of them is the tendency of students to become dependent on technology so that they do not optimally develop their cognitive and social abilities. Therefore, the use of technology in education must be balanced with the role of an effective teacher in guiding students. Overall, technology has great potential to improve student learning outcomes. However, the use of technology must be considered properly and must be carried out effectively and responsibly. This will help ensure that technology is used appropriately and can help students reach their full potential.

E. CONCLUSION

Educational technology has brought many benefits to the learning process in today's digital era. In education, technology can assist educators in delivering learning material more interestingly and interactively. In addition, technology can also help students to understand and remember the material delivered by the teacher more easily. Various educational technologies currently available, such as learning multimedia, e-learning, and educational games, have proven their effectiveness in improving student learning outcomes. Therefore, educators need to understand how to use appropriate educational technology to improve learning quality and achieve the desired learning goals. One important thing that needs to be considered is the selection of educational technology that suits the needs of students and the desired learning. In addition, educators also need to consider how to use appropriate technology and learning strategies that can increase the effectiveness of educational technology in the learning process. Thus, educational technology can be a very effective tool in improving student learning outcomes if used correctly.

REFERENCES

1. Akrim, A. (2020). The Factors That Affecting Students' Learning Difficulties In The Islamic Education Subject. *Intiqad: Jurnal Agama dan Pendidikan Islam*, *12*(2), 151-170.

2. Andriyani, N. L., & Suniasih, N. W. (2021). Development of learning videos based on problem-solving characteristics of animals and their habitats contain in IPA subjects on 6th-grade. *Journal of Education Technology*, *5*(1), 37-47.

3. Butar-butar, I., Sitorus, J., Rantung, D. A., & Boiliu, N. I. (2023). Implementation of Educational Technology in the Development Area in Christian Religious Education in the Digital Age. *International Journal of Multidisciplinary: Applied Business and Education Research*, *4*(2), 402-412.

4. Cain, J. P. (2020). A qualitative study on the effect of podcasting strategies (studycasts) to support 7th grade student motivation and learning outcomes. *Middle School Journal*, *51*(3), 19-25.

5. Chen, X., Zou, D., Xie, H., & Cheng, G. (2021). Twenty years of personalized language learning. *Educational Technology & Society*, *24*(1), 205-222.

6. Crawford, A., Weber, M. R., & Lee, J. (2020). Using a grounded theory approach to understand the process of teaching soft skills on the job so to apply it in the hospitality classroom. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *26*, 100239.

7. Di Vaio, A., Hasan, S., Palladino, R., & Hassan, R. (2023). The transition towards circular economy and waste within accounting and accountability models: A systematic literature review and conceptual framework. *Environment, development and sustainability*, *25*(1), 734-810.

8. Digdowiseiso, K. (2022). Pattern of Absorption of the Provincial Budget for the Special Capital Region (DKI) of Jakarta. *Atestasi: Jurnal Ilmiah Akuntansi*, *5*(1), 1-15.

9. Karubaba, K. Y. (2022). The Effect of Management and Internal Audit Inspectorate on the Effectiveness of Internal Controls on the Procurement of Goods and Services for the Government of West Papua Province. *SEIKO: Journal of Management & Business*, *5*(2), 290-299.

10. Kutieshat, R., & Farmanesh, P. (2022). The impact of new human resource management practices on innovation performance during the COVID 19 crisis: a new perception on enhancing the educational sector. *Sustainability*, *14*(5), 2872.

11. Metekohy, L. M., Daliman, M., Metekohy, B., & Ming, D. (2022). The impact of teaching and learning quality process to school and university education for sustainable future. *JPPI (Jurnal Penelitian Pendidikan Indonesia)*, *8*(1), 143-151.

12. Michie, S., West, R., Rogers, M. B., Bonell, C., Rubin, G. J., & Amlôt, R. (2020). Reducing SARS-CoV-2 transmission in the UK: A behavioural science approach to identifying options for increasing adherence to social distancing and shielding vulnerable people. *British Journal of Health Psychology*, *25*(4), 945-956.

13. Miranda, J., Navarrete, C., Noguez, J., Molina-Espinosa, J. M., Ramírez-Montoya, M. S., Navarro-Tuch, S. A., ... & Molina, A. (2021). The core components of education 4.0 in higher education: Three case studies in engineering education. *Computers & Electrical Engineering*, *93*, 107278.

14. Pangaribuan, B. W., Purba, N., Siahaan, K. W. A., Sidabutar, E. F., Sihombing, V. T., Simamora, D. F., & Matondang, J. R. (2022). The Implementation of Demonstration Method to Increase Learning Outcome in Natural Science Lessons. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(4), 3680-3692.

15. Pettersson, F. (2021). Understanding digitalization and educational change in school by means of activity theory and the levels of learning concept. *Education and Information Technologies*, *26*(1), 187-204.

16. Priscilla, M., Sulaeman, S., & Sofiani, V. (2022). The Authors Are Interested in Conducting Research on Human Resource Management Audits on HR Recruitment to Assess

Effectiveness in Jampang Kulon Hospital. *JASa (Jurnal Akuntansi, Audit dan Sistem Informasi Akuntansi)*, *6*(3), 316-330.

17. Rahmawati, R., Lestari, F., & Umam, R. (2019). Analysis of the effectiveness of learning in the use of learning modules against student learning outcomes. *Desimal: Jurnal Matematika*, *2*(3), 233-240.

18. Retnawati, E. (2019). Efforts to support and expand the use of educational technology as a means of delivering learning. *IJIET (International Journal of Indonesian Education and Teaching)*, *3*(1), 128-137.

19. Saihu, S. (2020). The Effect of Using Talking Stick Learning Model on Student Learning Outcomes in Islamic Primary School of Jamiatul Khair, Ciledug Tangerang. *Tarbawi: Jurnal Keilmuan Manajemen Pendidikan*, *6*(01), 61-68.

20. Sweller, J. (2020). Cognitive load theory and educational technology. *Educational Technology Research and Development*, *68*(1), 1-16.

21. Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society*, *65*, 101565.

22. Tugun, V., Bayanova, A., Erdyneeva, K., Mashkin, N., Sakhipova, Z., & Zasova, L. (2020). The opinions of technology supported education of university students. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(23), 4-14.

23. Wolters, C. A., & Brady, A. C. (2020). College students' time management: A self-regulated learning perspective. *Educational Psychology Review*, 1-33.

24. Zhang, T., Shaikh, Z. A., Yumashev, A. V., & Chłąd, M. (2020). Applied model of E-learning in the framework of education for sustainable development. *Sustainability*, *12*(16), 6420.

25. Zhao, L., Hwang, W. Y., & Shih, T. K. (2021). Investigation of the physical learning environment of distance learning under COVID-19 and its influence on students' health and learning satisfaction. *International Journal of Distance Education Technologies (IJDET)*, *19*(2), 77-98.