SocioEdu: Sociological Education
https://e-journal.unmuhkupang.ac.id/index.php/se
ISSN 2746-3567 (Online)

TEACHERS' AND STUDENTS' PERSPECTIVES ON USING DIGITAL EDUCATIONAL TOOLS DURING THE PROCESS OF LEARNING

*Grendi Hendrastomo[1], Nur Endah Januarti[2]
[1, 2]Universitas Negeri Yogyakarta, Indonesia

*Corresponding author e-mail: ghendrastomo@uny.ac.id

ABSTRACT. This research aims to understand how the sociology learning process using digital learning media in high schools in Yogyakarta City. The article presents the proportion and variety of digital learning media used by teachers and students in sociology education. Data were collected using a quantitative approach. The data collection technique used was a questionnaire distributed to students, with data collected from 137 students in 3 high schools. The research results show that the sociology teaching process conducted by the teacher in the classroom combines the use of technology-based learning media. 94.9% of students stated that the teacher allowed the use of electronic devices in the learning process. As many as 98.5% of students stated that they use electronic devices to support the learning process. Various integrations of digital learning media in education, such as the use of laptops, smartphones, and the utilization of the internet to support and enrich learning materials. This is supported by 97.8% of students owning and using laptops, smartphones, and internet access, with a proportion of 0.7% bringing only laptops, 64.2% owning mobile phones, 0.7% bringing both mobile phones and tablets, and 31.4% bringing both laptops and mobile phones to school. Supporting materials are obtained from e-books, YouTube, and articles. The level of media usage by students is 76.6% using e-books, 69.3% accessing YouTube, 10.9% accessing articles, and 66.4% of students using media to understand the material through practice questions.

Keywords: digital book, teaching sociology, learning media, gen-z, tech-savvy

INTRODUCTION

In the past 20 years, the development of communication and information technology has become a phenomenon that has changed the way we engage in activities. The exponentially increasing computational capabilities following Moore's Law (Hikam, 2020) have presented various opportunities that have never been experienced and enjoyed by the masses. Technology provides several conveniences in communication, offers various opportunities to everyone, and presents choices that were not available before. Through technology, people's perceptions change. A person's expectations are always related to the ease, usefulness, and benefits that accompany the presence of a technology. One of the technologies that was discovered and continues to be astonishingly impactful to this day is the internet. The internet makes the transfer of digital data very easy, integrates various computing devices, and turns networking into something simple. The development of technology has also greatly changed the behavior and culture of society. Technology has become a paradox for humanity. On one hand, technology promises ease and practicality, but on the other hand, technology can overly lull humans and is vulnerable to threats against the existence of human habits (De Cremer & Kasparov, 2022). One of them is in the field of education, where technology becomes a challenge that must be embraced to accelerate and improve the quality of education. In addition, technology is expected to drive efficiency both in the learning process, education, and in the teaching process. In the world of education, technology plays an important role as an accelerator in improving the quality of the learning process. The way students acquire knowledge is facilitated by access to technology through the internet, supported by various advanced gadgets that meet students' needs. Students today are already tech-savvy, as evidenced by the way they utilize technology. Almost all students have tablets, laptops, or smartphones that they use to support their education. One of them is to search for study materials. The process of searching for materials no longer relies on textbooks but has expanded with the use of the internet.

Internet penetration in Indonesia in 2024 reached 79,5% of the total Indonesian population (APJII, 2024) and that figure will continue to increase. This

is also supported by the increasing use of smartphones, where in 2015 there were 54 million smartphone users and in 2023 it skyrocketed to 209.3 million users (Andalas, 2024). With such high achievements, it is not surprising that almost all students in schools utilize mobile devices to support the learning process. As an important part, it cannot be denied that technology can stimulate an increase in students' interest in learning if used appropriately.

Sociology is a subject that studies the relationships of individuals within society. Sociology is a social science used to bridge the patterns of behavior and interactions of students within the social environment. This science is important as a foundation for students to understand the nature of life in an uncertain and highly dynamic social environment. In high school lessons, sociology occupies an important place. As one of the Social Sciences subjects that is made a compulsory subject and tested nationally, sociology becomes a subject that must be understood by students. However, the implementation in the field shows that this subject is often underestimated because it is considered easy, done daily, and boring due to being too textbook-based without many examples and not easily understood (Hendrastomo & Januarti, 2018). This condition is exacerbated by the low interest of students in learning. This can actually be encouraged through the utilization of technological advancements using various sophisticated gadgets owned by the students. One way is by utilizing the capabilities of tablets, laptops, and smartphones to display digital media through e-paper, e-books, e-magazines, etc.

The use of digital learning media in sociology education is a way and encouragement to make students interested and motivated to develop sociology as a field of knowledge. This process is certainly initiated by starting the use of information technology in the classroom learning process. The use of digital learning media is considered one of the urgent matters that teachers need to address, but until now not all teachers are capable of and use information technology in the learning process. The obstacles and challenges in using digital learning media do not only come from teachers but also from school policies. However, many students are interested and feel the benefits of using digital learning media in their learning activities.

Through the process of developing and disseminating information digitally, many information providers now offer digital versions of information packaged in the form of interactive and communicative media. This media has several advantages, namely easy access, downloadability, and an interactive content display that combines text, images, and is visualized in an engaging manner, so readers do not get bored reading it. Among the many media that provide digital versions of information, Detik/Kompas magazine stands out in terms of appearance and content visualization. In that digital format, the magazine can be accessed through devices with Android or iOS and can also be downloaded in PDF format. Interestingly, this magazine, even when downloaded in PDF format, can display interactive chart/diagram visualizations. Thus, when reading news/information content, readers are also presented with electronic displays similar to television to reinforce and enhance their understanding of the information. From the development of information technology, the researcher is interested in developing a digital magazine model that combines text and image visualization to stimulate students' reading interest (Haleem et al., 2022), especially to understand high school sociology lessons, and to conduct research on students' responses to the use of digital magazines. The use of digital learning media in high school sociology education is interesting to discuss from both the perspective of students and teachers. This article will generally explain to determine the preferences of teachers and students in using gadgets during learning in the teaching and delivery of sociology material.

METHOD

This research uses a quantitative approach where data is obtained through surveys. the questionnaire was given to students studying sociology. The number of respondents is 137 students from the Social Sciences class, originating from 3 (three) high schools in the city of Yogyakarta. Data analysis was conducted descriptively to observe the proportion of electronic device usage and ownership, internet access, and the utilization of electronic equipment in the sociology learning process.

RESULT AND DISCUSSION

Student and Digital Media

Changes in life encourage humans to adapt to existing developments. Technology has become one of the triggers of social change in society. Every second, new technology is discovered that changes lives. Humans never imagined that the emergence of mobile phones, the internet, and computers would change life in many ways. Technology brings about change and adaptation in every generation (Yoga, 2019). The technological revolution began with the media as the first domain affected by the technological revolution, where one of the changes was the increasing conversion of books and magazines into digital versions. Many famous newspapers in the world have started to be affected

by the rise of digital newspapers (e-papers) (Karimi & Walter, 2015), so almost all major publishers now have digital pages as one form of adaptation to technological developments.

Technology today has surpassed what was imagined, where almost everyone is affected by technology. Almost all aspects of life involve the intervention of technology, ranging from communication, domestic activities, education and teaching, economy, politics, automotive, and various human activities that are always infused with technology. This creates a digital society where one of its characteristics is that it can never be separated from technology and uses technology as a part of its primary needs. Education and teaching have become one of the areas that have changed in relation to technological development. In the context of education to create a knowledge society, it is necessary to have individuals who possess adaptability to change, including how teachers and students can utilize technology to enhance their knowledge capacity (Ciolan et al., 2014). Teachers are required to utilize technology for the success of their students. By using technology, students are not only expected to be IT literate but also to always access the latest information (novelty).

The current era is very different from the early '80s. Students have a different social environment, including how their learning methods have undergone a revolution, shifting from offline to online. Students today belong to Generation Z and Alpha, which are the early parts of the digital society. Digital society is a term used to classify a society that has been in contact with technology since birth and upbringing. Today's learners are individuals who have naturally interacted with technology since the moment they were born (digital natives) (Ting, 2015). According to Junco (Ting, 2015), digital natives are a generation that connects themselves with the use of information and technology to access, create, disseminate all kinds of information, videos, and texts through networks in their enjoyable worldly lives. This generation also reads in different ways, especially with the help of technology. Students today possess digital competence where they can produce and consume digital information (Salganova & Osipova, 2023).

Digital learners have the autonomy to determine what information they need. Digital learners do not require parental roles to force them to obtain information, because they will seek it out on their own. Digital learners are more motivated by curiosity and social environment. In obtaining information, digital learners make greater use of technology and the internet as their primary learning sources. Thus, in this case, the role of printed information sources is gradually being left behind.

Social change in society is a natural occurrence and will always happen. This change is partly supported by the increasingly massive development of technology. The discovery of the World Wide Web in the early 80s marked a historical leap, after which developments in the world progressed rapidly (Okunev, 2023). After that, the leap in technological development became unstoppable.

The new generation continues to collaborate with technological advancements, including students. High school students today are children born in the 2000s (Generation Z), a decade when society began to become familiar with the internet, the early development of mobile phones, and the penetration of various advanced electronic devices. This generation includes digital natives, local people who have been familiar with and close to technology since birth (Agárdi & Alt, 2024). The generation born in the 2000s has now become adults, and the technology that has been with them since childhood has become increasingly sophisticated, making it impossible for students to detach from advanced technological devices.

The ease and speed of access, cutting-edge features and technology, preferences, and the use of social networking applications as digital media encourage students to always be and not be far from electronic devices. Electronic devices with fast internet access have become a necessity to own. Almost all students currently bring electronic devices to school. A survey in three high schools in the city of Yogyakarta, revealed the actual reality where 97.8% of students bring electronic devices when they are at school.

Table 1. Ownership of Electronic Equipment by School

No	School	Respondent	% Ownership of Electronic Equipment
1	School A	49	98
2	School B	40	100
3	School C	48	95.8

This shows that the ownership and use of electronic devices in schools are no longer something strange and rare. Currently, when almost all students possess and bring electronic devices, technology-based learning becomes a necessity. Technology drives the learning process to a new point where technology is no longer something to be feared and eliminated, but rather embraced to formulate policies that benefit society and can be used in the learning process.

97.8% of students who brought electronic devices, the majority of the electronic devices brought were mobile phones (64.2%), 31.4% brought laptops and mobile phones, 0.7% brought laptops, and 0.7% brought mobile phones and tablets. The use of mobile phones as communication tools, which

also serve as information search devices, makes mobile phones (smartphones) a 'must-have' item. The smartphones used by students are mostly based on Android (89.7%), iOS (8.8%), and Windows (0.7%). The condition is in line with data released by detik.com, which stated that in 2015, the Android operating system dominated 94% of the Indonesian market, while 6% was controlled by Apple's iOS.

Recently, there has been a change in school policy regarding the ownership of electronic devices by students. Initially, many schools prohibited the bringing of electronic devices (cell phones) to school. Schools believe that bringing electronic devices to school actually makes students unfocused on the lesson material and instead use the electronic devices for negative purposes. Cell phones in several schools then became targets of raids. That situation is now starting to change. Schools, especially high schools, are starting to open up and revise those policies. Many schools nowadays are starting to allow students to bring electronic devices to school. Students are responding to the policy change by equipping themselves with electronic devices. More and more students are bringing laptops, cell phones, tablets, and other electronic devices to school.

The change in mindset and school policies is currently driven by the function of electronic devices, which are no longer viewed solely from a negative perspective, but rather have many positive aspects when controlled and used appropriately. Bringing laptops, mobile phones, or tablets to school, besides being a means of communication, is also used by students to support the learning process. The development of smartphone technology today has made the function of mobile phones not only for sending messages but also for searching for information. Smartphones combined with internet access will add a different dimension to the learning process, especially for accessing information to support the delivery of material. Internet access can be easily obtained by students either through data packages from communication providers or through school wifi. From a survey conducted in 3 schools in Yogyakarta City, it was found that 67.2% of students equipped their electronic devices with internet access, and 97.8% of them admitted to using internet access at school. This condition shows that internet access in schools has become a necessity. The infrastructure and facilities in schools today also support internet penetration.

The majority of schools today have internet access that is broadcasted limitedly within the school environment. Wifi has become a common feature and is always present in every school, although in terms of access speed and signal coverage, it has not yet been able to provide a comprehensive experience for students. Limited bandwidth often makes the school's wifi unusable for data access due to the increasing number of students using it. This often frustrates students, especially when internet access is truly needed to supplement the supporting material for their subjects. Currently, only 47.4% of students use the school's wifi. The majority of students (94.9%) equip their phones with data packages, allowing them to independently access the internet anytime and anywhere.

The growth of electronic device usage in the learning process can drive innovation by both students and teachers. Electronic devices become media, tools for conveying messages, that provide new experiences in learning. Electronic devices become digital media used by students to enrich the lesson material delivered by the teacher. In the process of sociology learning, the use of electronic equipment (digital media) supports the delivery of material to be richer, broader, and deeper. The nature of this subject, which discusses factual social conditions, is very suitable when combined with unlimited information. The use of digital media in sociology learning encourages students to broaden their horizons in exploring social issues and phenomena. The abstract nature of the material is bridged by digital media, allowing teachers to provide examples or additional information obtained from internet searches when delivering the material.

Table 2. Internet Access Usage by Students

No	Internet Access Usage	Percentage (%)
1	Social media	72.3
2	News sites	22.6
3	Search	83.9
4	Gaming apps	11.7

The table above shows that most students utilize internet access for searching and browsing. This activity greatly supports the learning process because it aligns with the Kurikulum Merdeka implemented in all schools, encouraging a shift in the learning process from teacher-centered to student-centered. The use of digital media and information technology encourages students to become more actively involved in the learning process. With active involvement in the pursuit of knowledge, students are ultimately able to understand the subject matter better. Discussions can develop optimally with extensive informational support. 97.8% of students acknowledge that the use of learning devices can support the learning process. The use of electronic devices is employed for presentations, searching and enriching materials, and completing assignments.

Teachers and Innovation in Information Technology-Based Learning

Learning is an aspect of development that refers to changes (modifications) in behavior as a result of practice and experience. Learning is a complex

process that occurs within each person throughout their life (Donaldson & Allen-Handy, 2023). Learning can happen anytime and anywhere. A sign that someone has learned is a change in their behavior, which may be caused by changes in their level of knowledge, skills, or attitude. Learning encompasses not only subjects but also mastery, habits, perceptions, pleasures, interests, social adjustments, various skills, and aspirations. Learning involves the occurrence of changes in perception and behavior, including behavioral improvement (Gilbert et al., 2001). Hilgard and Brower (Wadtan et al., 2024) define learning as a change in behavior through activity, practice, and experience. There are various learning theories in Hamalik (Hamalik, 2014), including: (1) Simple conditioning or the theory of contiguity emphasizes that learning consists of the generation of responses with stimuli that initially are neutral or inadequate to elicit the response but eventually are able to elicit the response. (2) Connectionism, stimulus-response, or reinforcement theory emphasizes that learning consists of the formation of bonds or connections between stimulus-response that are formed through repetition. (3) Field theory was formulated as a reaction to conditioning and reinforcement theories, which are considered atomistic in nature. Field theory emphasizes the whole from the parts, that the parts are closely related and mutually dependent on each other. (4) Phenomenological and Humanistic Psychology places great emphasis on the conditions within the individual, namely the psychological state of the student. (5) S-R Definition (Relatively), this idea is based on the concept of cause and effect used in the natural sciences of mechanistic behavior. Human behavior is the result of external influences without assuming the presence of dynamic factors in that behavior. Human behavior is moral behavior and the overall behavior towards stimuli.

The learning process requires the active participation of students, so teaching should be more student-centered. The solution to the learning process that is only lecture-oriented is to use a presentation method that employs audiovisual media. Audio-visual media is used because with this media, the learning process is no longer just about listening, but also seeing and feeling. According to Einstein's concept (Wenger, 2012), vision (visual) contains more information than our other senses. We also process a lot of information through hearing. From various studies, it has been proven that 80% of our brain areas are involved in visual responses, more than any other sense. From that argument, it is based on why audiovisual media are more attractive to use in the learning process.

Teaching tools as communication media in the teaching and learning process can be classified into three categories. First, tools that are actual objects that can provide direct and real experiences; second, tools that are substitute objects (imitations); and third, language, whether spoken or written (Hikmah, 2019).

Media/teaching materials play an important role in creating a learning atmosphere. Because through media, learning motivation will increase. Learning media stimulates students to learn new things, activates learning responses because it can provide immediate feedback on learning outcomes. Through learning media, appropriate exercises can be encouraged. Learning media will foster a love for learning in students.

Teaching media/materials indeed play an important role in the teaching and learning process. With learning media, it can save study time, facilitate understanding, increase student attention, enhance student activity, and improve student memory (Nurhalimah & Azzahra, 2023).

Teaching media/materials are very helpful in the teaching and learning process because they can be used to enlarge the small and reduce the large, simplify the complex, speed up the process or slow it down, and so on (Nur Fitria, 2022). Furthermore, learning media makes education highly capable, productive, simultaneous, equitable, current, and engaging (Laakso et al., 2021). Ideally, the process of communication or the process of education should be through direct experience (Januarti, 2022). If direct experience cannot be implemented, it should then be mediated, starting from imitation of experience (concrete) to the use of media in the form of digital symbols (abstract).

In the context of delivering educational or instructional messages, media is very effective in capturing attention (Hikmah, 2019). In the teaching and learning process, attention plays an important role. However, attention has the characteristic of being difficult to concentrate on for a long time. By using media, the attention of the learners can be controlled. The effective media for teaching and learning is interactive media (Putri, 2024). Students are given the opportunity to actively participate and provide responses while using the media.

Teachers have always been the central point in education. The success or failure of the learning process is greatly determined by the teacher. That paradigm is slowly shifting; the function and duties of teachers remain important, but in the learning process, the role of teachers is shifting to become companions and partners for students who will guide, strengthen, supervise, and control the subject matter discussed in class. Teachers today are no longer the sole source of learning. The development of technology and education requires teachers to be able to adapt to the changes that occur. At the beginning

of the internet's development, many teachers and schools were concerned about the negative effects of the internet. The spread of pornographic films and freedom became one of the triggers of concern. Almost all teachers and schools prohibit their students from bringing mobile phones to school, accompanied by frightening threats of sanctions. Currently, the shift in function and the need for using mobile phones as digital media can no longer be contained. Discussions and debates show that the negative effects are much smaller compared to the positive effects brought by technology. Whether we like it or not, education and the learning process must change, no longer resisting the tide of change, but following and utilizing that tide of change as a means to improve the quality of education. The use of mobile phones in class is no longer a taboo and does not have to be used secretly.

Sociology teachers at 3 schools in the city of Yogyakarta unanimously agree that the use of information technology has become a necessity. In Yogyakarta, teachers are given the freedom by schools to decide whether or not to allow the use of information technology in schools. The authority to permit lies with the teacher. Some teachers respond by allowing students to access the internet with the mobile phones they bring. 94.8% of teachers allow students to use mobile phones and electronic devices in the learning process. The teacher encourages students to use their electronic devices to enhance their understanding of the material. The habit and frequent use of cell phones by students are not addressed by prohibiting them, but by responding to that habit by turning it into something positive.

The teacher's explanation shows that, even though it is prohibited, cell phones will be used secretly. The secretive use of mobile phones is what actually tempts students to use them for negative purposes unrelated to the learning material. With a different approach, teachers actually strive to utilize the electronic devices brought by students to enhance and reinforce the lesson material. At the same time, by using mobile phones in the learning process, teachers can improve their control over students' activities. The use of mobile phones becomes more directed, which indirectly reduces the use of mobile phones for negative purposes.

Table 3. Benefits of Accessing Information Technology in the Learning Process

No	Media	Percentage (%)
1	Social media	40.9
2	News sites	27
3	Search engine	95.6
4	Gaming apps	5.8
5	E-Book	22.6

From the table, it can be seen that the majority of information technology usage in the learning process is utilized to search for lesson materials or related information. The use of social media in the classroom is quite high, with applications like WhatsApp, Facebook, Twitter, and Instagram dominating its usage by students. Seeing the data, the innovation in developing teaching strategies by teachers in the future can seize that opportunity by utilizing social media as a medium for learning. Whatsapp can not only be used for chatting or conversing, but it can also be utilized as a medium for discussions among students and teachers. Facebook and Instagram can be encouraged for use and to support the delivery of material. In sociology learning, Instagram can be used to assign students to find and take pictures of social issues in their immediate environment, post/upload them on Instagram, and then discuss them. In other words, the change in students' habits is interpreted positively and used to bring them closer and increase their interest in learning.

Sociology teachers have been extensively utilizing digital media in the learning process. The use of media as supporting materials is widely practiced by students. The use of the internet as supporting material is shown in the table below.

Table 4. Utilization of the Internet as Supporting Material

No	Supporting Material	Percentage (%)
1	E-Book	23.4
2	Youtube	30.7
3	Article/news	89.1
4	Student worksheet	33.6

From the table, it is evident that online articles/news dominate as supporting materials. Interestingly, students are making extensive use of internet access to practice questions, which shows that they actually understand the material by searching for supporting questions.

For teachers, internet access is also used to complement and create technology-based learning media. Electronic equipment is used to create learning media. One of the commonly used tools is the use of PowerPoint as a medium for delivering material. PowerPoint is widely used because of its ease and flexibility of use. Almost all schools nowadays have provided projectors as minimal equipment in the classroom.

In sociology learning, the most commonly used media by teachers is PowerPoint, where text is combined with images and videos. From the survey, it was also found that downloading videos from YouTube is frequently done by sociology teachers, considering that the easiest and simplest way to convey abstract sociology materials is by showing real-life realities, which can be bridged by playing videos. 76.6% of students stated that their sociology teacher often uses YouTube as a learning medium.

Meanwhile, in class discussions, 36.5% of students stated that the materials used by the teacher for discussions were obtained from online articles/news.

Table 5. Digital Media Used by Teachers

No	Media Digital	Prosentase (%)
1	PowerPoint	97.8
2	Article/online news	36.5
3	Youtube	76.6
4	Podcast/song	19.7
5	EBook	19
6	Others (Film)	20.4

The use of internet access and the utilization of technology have become a necessity for teachers to adapt to social changes, interests, and characteristics of students. Teaching sociology in an enjoyable way is necessary to embrace change, especially with the increasing prevalence of technology, so sociology education must use that momentum to improve the learning process. Sociology teachers inevitably have to innovate in the classroom learning process.

CONCLUSION

The use of information technology in the learning process has become a necessity. The ease of ownership and internet access is supported by educational policies in schools that allow the use of electronic devices in learning. Almost all students nowadays bring electronic devices to school. On one hand, this shows that the current generation is identical and close to technology, which can serve as an entry point for developing knowledge. On the other hand, if this is not utilized and directed, it will encourage the use of technology outside the learning process. Teachers need to embrace this change by utilizing technology as an innovation in the learning process. This research has limitations related to the inability to capture the extent of improvement in students' understanding by utilizing information technology to comprehend sociology lesson materials. This research only captures a superficial picture of the habits and basic characteristics possessed by students, teachers, and schools in utilizing electronic devices (smartphone) in the learning process.

REFERENCES

Agárdi, I., & Alt, M. A. (2024). Do digital natives use mobile payment differently than digital immigrants? A comparative study between generation X and Z. *Electronic Commerce Research*, *24*(3), 1463–1490. https://doi.org/10.1007/s10660-022-09537-9

APJII. (2024). *APJII Jumlah Pengguna Internet Indonesia Tembus 221 Juta Orang*. Https://Apjii.or.Id/Berita/d/Apjii-Jumlah-Pengguna-Internet-Indonesia-Tembus-221-Juta-Orang.

Ciolan, L., Petrescu, A., Radulescu, C., & Bucur, C. (2014). Training Teachers to Use Digital Resources for the Knowledge Society. *Procedia - Social and Behavioral Sciences*, *128*, 415–419. https://doi.org/10.1016/j.sbspro.2014.03.180

De Cremer, D., & Kasparov, G. (2022). The ethical AI—paradox: why better technology needs more and not less human responsibility. *AI and Ethics*, *2*(1), 1–4. https://doi.org/10.1007/s43681-021-00075-y

Donaldson, J. P., & Allen-Handy, A. (2023). What is learning? A complex conceptual systems analysis of conceptualizations of learning. *International Journal of Educational Research Open*, *4*, 100254. https://doi.org/10.1016/j.ijedro.2023.100254

Gilbert, C. D., Sigman, M., & Crist, R. E. (2001). The Neural Basis of Perceptual Learning. *Neuron*, *31*(5), 681–697. https://doi.org/10.1016/S0896-6273(01)00424-X

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Hamalik, O. (2014). *Psikologi Belajar dan Mengajar*. Sinar Baru Algensindo.

Hendrastomo, G., & Januarti, N. E. (2018). *Ecomedia Pembelajaran: Ragam Media Sederhana untuk Pembelajaran Sosiologi*. UNY Press.

Hikam, F. (2020). Peran Keluarga dalam Pembelajaran Berbasis E-learning pada Masa Wabah Covid-19. *PANDAWA*, *2*(2). https://ejournal.stitpn.ac.id/index.php/pandawa/article/view/695

Hikmah, D. (2019). Media For Language Teaching and Learning in Digital Era. *International Journal of English Education and Linguistics (IJoEEL)*, *1*(2), 36–41. https://doi.org/10.33650/ijoeel.v1i2.963

Januarti, N. E. (2022). *Kontradiksi E-Learning: Perubahan Relasi Intersubyektif Antara Guru Dan Siswa*. https://doi.org/10.21831/socia.v19i1.50759

Karimi, J., & Walter, Z. (2015). The Role of Dynamic Capabilities in Responding to Digital Disruption: A Factor-Based Study of the Newspaper Industry. *Journal of Management Information Systems*, *32*(1), 39–81.

https://doi.org/10.1080/07421222.2015.1029380

Laakso, N. L., Korhonen, T. S., & Hakkarainen, K. P. J. (2021). Developing students' digital competences through collaborative game design. *Computers & Education*, *174*, 104308. https://doi.org/10.1016/j.compedu.2021.104308

Nur Fitria, T. (2022). Using Authentic Material and Created Material (Teacher-Made) for English Language Teaching (ELT): Benefits and Limitations. *JADEs Journal of Academia in English Education*, *3*(2), 117–140. https://doi.org/10.32505/jades.v3i2.4674

Nurhalimah, D., & Azzahra, D. T. (2023). The Impact of Learning Media on Students' Development in Learning. *International Journal of Students Education*, *1*(2), 264–266.

Okunev, R. (2023). History of the Internet, Search Engines, and More. In R. Okunev (Ed.), *The Psychology of Evolving Technology: How Social Media, Influencer Culture and New Technologies are Altering Society* (pp. 9–16). Apress. https://doi.org/10.1007/978-1-4842-8686-9_2

Putri, I. A. (2024). The Influence Of Interactive Learning Media In Improving Students' Critical Thinking Skills In Computer System Subjects Software Utilisation. *Jurnal Ilmiah Mandala Education*, *10*(4), 811. https://doi.org/10.58258/jime.v10i4.7507

Salganova, E., & Osipova, L. (2023). Students' Digital Literacy: Competence-Based Approach. *Economic and Social Changes: Facts, Trends, Forecast / Экономические и Социальные Перемены: Факты, Тенденции, Прогноз*, *1 (85)*. https://doi.org/10.15838/esc.2023.1.85.12

Andalas, S. (2024). *209,3 Juta Orang di Indonesia Menggunakan Smartphone pada Tahun 2023*. Https://Data.Goodstats.Id/Statistic/2093-Juta-Orang-Di-Indonesia-Menggunakan-Smartphone-Pada-Tahun-2023-Cbha0.

Ting, Y.-L. (2015). Tapping into students' digital literacy and designing negotiated learning to promote learner autonomy. *The Internet and Higher Education*, *26*, 25–32. https://doi.org/10.1016/j.iheduc.2015.04.004

Wadtan, R., Sovajassatakul, T., & Sriwisathiyakun, K. (2024). Effects of team-based Ubiquitous learning model on students' achievement and creative problem-solving abilities. *Cogent Education*, *11*(1). https://doi.org/10.1080/2331186X.2024.2303550

Wenger, W. (2012). *Beyond Teaching & Learning: Memadukan Quantum Teaching & Learning* . Nuansa.

Yoga, S. (2019). Perubahan Sosial Budaya Masyarakat Indonesia Dan Perkembangan Teknologi Komunikasi. *Jurnal Al-Bayan*, *24*(1). https://doi.org/10.22373/albayan.v24i1.3175