



Digital Learning Media: A Review

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Abstract

Digital learning media is the use of technology in the form of software to distribute information (transfer of knowledge) to students. The purpose of using digital learning media is so that students can receive knowledge, and skills, more easily, without being constrained by space and time. Digital learning systems require infrastructure and technology support, such as computers, internet access, servers, television, interactive video, CD/DVD ROM, and soon. Digital learning can be done in two ways, namely fully digital or in combination with face-to-face (face-to-face). Face to face can also be done by involving technology, such as video conferencing or teleconferencing. The success of developing digital learning requires a gradual design. Digital design is known as storyboarding and visual mapping (visual map). This design is specifically focused on the use of advanced methods in digital learning, especially on the aspects of design and its principles.

Keywords: learning media, digital learning, intelligence artificial

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Introduction

Technology can be used by lecturers to assist in the teaching and learning process in the classroom or outside the classroom. The use of instructional media aims to facilitate the delivery of material from lecturers to students and increase student interest and willingness in the courses fostered by lecturers. Therefore, learning media needs to be used by lecturers so that learning can take place well and student learning outcomes can increase. In addition to using learning media, lecturers must emphasize learning by doing as an effort to train student competencies. These competencies can improve students' ability to solve problems and think critically in the learning process (Saepuloh et

al., 2021). In the learning process, competencies can be implemented through a scientific approach. Student competencies can be optimized by implementing student-centered learning so that in learning students can learn independently to solve problems given during learning. Therefore, learning media is needed that support students to learn independently in solving problems (Supriasih et al., 2022) and for lecturers to deliver learning according to their duties (Akbar et al., 2020).

Digital learning media are in the form of hardware and software that are used to convey information (Abdulrahman et al., 2020). In the learning process, lecturers are assisted with learning media in conveying all information to students. According to some experts, learning media is any person, material, tool, or event that can create conditions that allow students to receive knowledge, skills, and attitudes (Ng et al., 2023). Thus, digital learning media cannot be separated from the learning process in the classroom and outside the classroom. There are several benefits of digital learning media in, namely (1) increasing student interest in learning. (2) clarifying information. (3) eliminate the limitations of space and time. (4) fostering independent learning. Digital learning media has several benefits, including (1) clarifying the presentation of messages and information so that they can facilitate and improve learning processes and outcomes, (2) improving learning outcomes, and directing students' attention so that it can lead to learning motivation, more direct interaction between students and their environment, and allowing students to learn independently according to their abilities and interests. (3) overcoming the limitations of the senses, space, and time. (4) providing students with a common experience of events in their environment, as well as allowing direct interaction with lecturers, the community, and the environment. With various benefits, lecturers can use digital learning media to maximize information in learning. Various studies have been carried out by experts in the context of developing learning media by utilizing the development of digital technology (Daryanes et al., 2023); (Abuhassna et al., 2020). This development resulted in a new paradigm which is often called digital learning media. The development of learning media in the digital era is often referred to as digital learning media. Digital learning media is the use of technology in the form of software to distribute information (transfer of knowledge) to students. The purpose of using digital learning media is so that students can receive knowledge, and skills, more easily, without being constrained by space and time. Digital learning media by utilizing software that is online or offline.

According to (Marpanaji et al., 2018), there are several principles in the selection of digital learning media, namely (1) identifying the characteristics of the media, media conditions, performance (performance), or the level of each learning goal, and (2) identifying student characteristics that require learning media. , (3) identify the characteristics of the learning environment related to the learning media to be used, (4) identify practical considerations that allow which media are easy to implement, and (5) identify economic and organizational factors that determine the ease of use of digital learning media. Another expert (Mayang Sari et al., 2023), conveyed the principle of choosing learning media, digital is (1) appropriate, meaning that the learning media used is by basic competencies, (2) efficient, meaning that digital learning media used can increase student motivation, (3) varied, meaning that the digital learning media used were able to encourage students' active attitudes in learning. If the lecturer can choose, design, and create digital learning media according to the principles of being effective, efficient, and varied. So the benefits of digital learning media such as increasing interest, motivation, clarifying information, eliminating space and time limitations, and learning independence are expected to be maximized so that learning outcomes also increase.

Methodology

This study is a literature review by collecting various information from journals and proceedings. The database comes from Scopus, Web of Science, and Google Scholar. Literature search using keywords digital learning, artificial intelligence, and educational technology. The results

of the article search obtained 121 articles, then filtered and obtained 20 potential articles, and then a literature review was conducted to obtain the latest findings.

Results and Discussion

One of the efforts to improve the quality of education is to build a learning system that is more interesting, interactive, and varied. Lecturers must have competence in developing learning media. Along with the development of technology and supporting infrastructure, it is possible to improve the quality of learning by utilizing technology in a system known as digital learning. Digital learning is a system that can facilitate lecturers to learn more broadly, more, and varied. Through the facilities provided by the system, students can study anytime and anywhere without being limited by distance, space, and time. The learning materials studied are more varied, not only in verbal form, but also in more varied forms such as text, visuals, audio, and motion. In digital learning, students and lecturers can communicate interactively by utilizing information and communication technology, such as computers with the internet, mobile phones with various types of information applications, video, telephone, or fax. The use of learning media depends on the structure of the learning material and the forms of communication required. Transcripts of conversations, examples of information, and digitally linked written documents or Web learning demonstrate the importance of digitally documented learning materials. More visual communication including images can be combined with conversation sessions, and video conferencing, which allows students who like to use different media to work with non-printed messages.

Digital learning is done by implementing a web-based or digital learning system that begins with good planning. Furthermore, the way learning materials are delivered (delivery content) to students must refer to planning. The scope of competence for a lecturer in digital learning includes planning and organizing learning, presentation skills both verbal and non-verbal, teamwork, questioning strategy skills, expertise in mastering learning materials, involving students in learning and coordinating learning activities, knowledge of learning theory, knowledge of digital learning, knowledge of lesson planning, and mastery of learning media (Le et al., 2018). Difference between learning that does not use technology and learning that uses technology and between learning in the classroom (classroom setting) and digital learning that does not have to be in the classroom.

Learning models have differences in teaching styles, techniques, and motivation of students and lecturers. The digital learning model is an effective future model because it is under the demands of the development of science and technology. The management of digital learning systems is different from conventional systems. Digital learning systems require infrastructure and technology support, such as computers, internet access, servers, television, video interactive, CD/DVD ROM, and so on. The involvement of the technology cannot be used directly, but a learning design that combines the technology effectively is needed. Digital learning can be done in two ways, namely fully digital or in combination with face-to-face (face-to-face). Face to face can also be done by involving technology, such as video conferencing or teleconferencing.

Successful development of a lesson digital design is required in stages. This design is specifically focused on the use of advanced methods in digital learning, especially on the aspects of design and its principles. Among them is the development of digital learning by storing written materials in HTML form. In general, people learn and listen to a reading from printed materials. The development of information and communication technology has changed data in printed form into digital materials that can be viewed on a monitor screen and can then be printed out. Ingredients presented on the digital web need to be designed with the text presented not like in a textbook but need to be organized. This is because there are differences in people's ability to read on a computer with direct reading and visual mapping which is not only for computer programs but also for TV programs, interactive CDs, and others (Palioura & Dimoulas, 2022). Digital learning can be formulated as a large collection of computers in networks that are tied together so

that many users can share their vast resources (Coman et al., 2020); (Schindler et al., 2017). Understanding digital learning includes aspects of hardware (infrastructure) in the form of a set of computers that are interconnected with each other and can transmit data, either in the form of text, messages, graphics, video, or audio. With this capability, digital learning can be interpreted as a computer network that is interconnected with other computer networks throughout the world. However, the notion of digital learning is not only related to hardware but also includes software in the form of data sent and stored which can be accessed at any time. Several computers that are interconnected with each other can create a sharing function which can simply be referred to as a network (networking). The sharing function created through a network (networking) does not only include facilities that are very and often needed, such as printers or modems, as well as those related to data or certain application programs.

Another advance related to digital learning as stated by (Bouarab-Dahmani & Tahi, 2015) is that many computer terminals around the world are connected to digital learning so many people use digital learning every day. Considering digital learning as a method or means of communication that can provide great benefits for the interests of researchers, teachers, and students, lecturers need to understand the characteristics or potential of digital learning to utilize it optimally for the benefit of student learning. The advantage of digital learning is that it is a fun medium so it creates student interest in digital programs. Learners who study well will quickly understand computers or can quickly develop the necessary computer skills, by accessing the Web. Therefore, learners can study anywhere at any time. Digital learning applies a learning system that does not take place in one place, so there is no direct face-to-face interaction between lecturers and students (Arlinda et al., 2022). Interaction between lecturers and students can be done, either in real-time (real-time) or real-time (not real). Interaction in the form of real-time (synchronous) can carry out direct interactions or online meetings (online meetings), real audio or real video, and chatrooms. Meanwhile, real-time (synchronous) interaction can be done with mailing lists, discussion groups, newsgroups, and bulletin boards. With real-time and real-time make it happen interaction between lecturers and students, can replace face-to-face direct interaction, although not completely.

This interaction is very possible to do using a variety of learning media so that it is easy for students to reach learning materials or other information, such as computer media technology with the internet. According to Kitao (1998), there are at least 3 potentials or functions of digital information and an educational or learning tool. Potential communication tools using digital learning can communicate anywhere quickly. For example, you can communicate using e-mail, or discuss via chat or mailing lists. Communicating by e-mail or chat is different and more effective and efficient than using telephone and facsimile (fax) which are both capable of conveying information very quickly. In the communication that uses the telephone, the farther the distance between people who communicate, the more expensive the telephone credit fee that must be paid. Payments will be even more expensive when the communication time lasts longer under the amount of information submitted. On the other hand, communicating through digital learning, the phone credit that is paid for is only local credit. There is no influence on the distance or proximity of the contact person (communicant). It is enough to pay the local telephone credit fee in addition to the monthly subscription fee to the Service Provider (ISP), then various information or documents that need to be communicated can be sent very quickly.

If there are enough documents to be sent, they can be carefully prepared in advance and then sent as an e-mail attachment (attachment). Thus, the possibility of misrepresentation of information can be avoided. Meanwhile, communication via facsimile (fax), the process is indeed very fast. Information or documents to be sent have been prepared in advance. The difference is that the farther the distance to the destination of sending faxes, the greater the costs to be paid. This shipping cost will be even greater when the number of sheets of documents that will be sent by fax increases. Even so, there is still no guarantee regarding the quality of receipt of documents sent, because sometimes there is a problem with receipt, for example, not all complete (complete)

sheets of documents are received at the destination, in addition to the quality of the textsometimes it is also unclear. or distorted. The communication described above is still one-to-one communication. By utilizing digital learning technology, communication from one person to many people (one-to-many communication) can be carried out simultaneously, namely through facilities; learning management system (LMS), e-mail, mailing list, or chat.

Through digital learning, various information can be accessed, such as weather forecasts, social developments, economy, culture, politics, science knowledge, and technology presented by various sources without having to subscribe. Students can access various references, both in the form of research results, as well as articles from studies in various fields. Digital learning is the largest library of any library, so students do not have to go directly to the library to look for various references (Kitao, 2002). Through digital learning, information in various available fields or developments that occur in all corners of the world (global world) can be accessed quickly and known by many people. Likewise, information relating to the field of education or learning is easy, plentiful, and fast to access. Learners do not have to be present in the classroom/lecture room to take part in learning activities, but it is enough to just sit from their respective places in front of the computer (of course using a computer equipped with a connection to digital learning facilities) and use it. Learners can interact with learning resources, both in the form of the learning material itself as well as with teachers who foster or are responsible for learning materials. With [16]This digital learning, students have the choice or alternative to learn face-to-face or through digital learning (Gherheş et al., 2021); (Paul & Jefferson, 2019).

The development of digital learning technology which is very rapid and has spread to all corners of the world has been utilized by various countries, institutions, and experts for various purposes, including education and learning. Efforts are being made to develop software (application programs) that can support improving the quality of education or learning. The software that has been produced will allow learning developers (instructional developers) to work with learning material experts (content specialists) to package electronic learning materials (digital learning materials). Electronic learning materials are packaged and entered into the network so that they can be accessed through digital learning, and then the availability of the learning program is disseminated so that it can be known by the general public, especially students. Teachers also need to have the ability to properly manage the implementation of digital learning activities via the Internet. Learning through digital learning can be given in several formats (Nguyen et al., 2022); (Haleem et al., 2022); (Scheel et al., 2022). including, "Electronic mail (delivery of course materials, sending in assignments, getting and giving feedback, using a course listserv., i.e., electronic discussion group, (2) Bulletin boards/newsgroups for discussion of special groups, (3) Downloading of course materials or tutorials, (4) Interactive tutorials on the Web, and (5) Real-time, interactive conferencing using MOO (Multiuser Object Oriented) systems or digital Relay Chat."

Conclusion

Students learn according to their desires, interests, abilities, and experiences. The principle of mobility allows students to learn by moving places according to circumstances that allow for the learning process to occur. Students can study with the same type, pathway, and level or can continue their education to a higher level according to the applicable requirements. The principle of efficiency is to empower various kinds of resources, such as human resources or available technology as optimally as possible so that students can learn. teachers, learners, developers, and policymakers to make rules and strengthen existing designs. Design components of digital learning include; syllabus, learning orientation, learning materials, calendar, site map, and assessment. The syllabus is a tangible form of a learning plan, both conventional and digital learning. In the syllabus there are several components of completeness, namely: competency standards, basic competencies, learning materials, learner learning experiences, time allocation,

and sources of materials/tools. The syllabus is useful material as a guide for further learning development, such as making lesson plans, managing learning activities, and developing assessments. Digital Learning Orientation: The purpose of digital learning includes several components, namely: biographies of lecturers and program support staff, and hopes and desires of learners which include opinions and characteristics of learners as participants in this program. There is also a brief description of the program and initial information as an introduction to the next program, as well as instructions for using the program for users. There is also information for easy access to programs, facilities available, links that can enrich this program, and ways to download materials available in this program. Learning Materials. This component provides basic learning materials that can be accessed by learners, either in the form of core learning materials additional learning materials (supplements), or enrichment materials. The material is presented in the form of full text or learning material that is presented in full as well as learning material that is presented in the form of the main points. In packaging, this learning material can involve other software, for example, PowerPoint. In this software, the learning material presented is only the basics, while the description is on the presenter and the learner's interpretation. Digital learning requires an advanced design or a higher design called "Advanced Method in Distance Education" and is directly applied to one form (tool).) digital learning, namely the Web Courses Tool (WebCT). By using this model, success in digital learning will be obtained. WebCT facilitates the discussion format by using the following criteria: (1) There is an initiative from individual learners to be involved in the discussion, (2) Distribution of incoming posts, (3) Expression or reaction of incoming posts, (4) Posts or discussion materials what is posted or displayed is relevant, (5) There is a contribution or active role from participants in active discussion activities, without the participation of all parties the discussion will never run well.

Conflicts of Interest

The authors declare no conflict of interest.

References

- Abdulrahman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., Imam-Fulani, Y. O., Fahm, A. O., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, 6(11), e05312. <https://doi.org/10.1016/j.heliyon.2020.e05312>
- Abuhassna, H., Al-Rahmi, W. M., Yahya, N., Zakaria, M. A. Z. M., Kosnin, A. Bt. M., & Darwish, M. (2020). Development of a new model for utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education*, 17(1), 38. <https://doi.org/10.1186/s41239-020-00216-z>
- Akbar, Y. F., Rizal, A., Tiara, Islami, N. N., & Hartanto, W. (2020). The urgency of using online-based learning media to enhance students' self-directed learning and result in a study on accounting chapter of economics subjects. *IOP Conference Series: Earth and Environmental Science*, 485(1), 012137. <https://doi.org/10.1088/1755-1315/485/1/012137>
- Arlinda, R., Wuryandani, W., & Mustadi, A. (2022). The Effect of Limited Face-to-Face Learning in New Normal Era Towards Learning Motivation of Elementary School Students. *AL-ISHLAH: Jurnal Pendidikan*, 14(3), 2963–2972. <https://doi.org/10.35445/alishlah.v14i3.1781>
- Bouarab-Dahmani, F., & Tahi, R. (2015). New Horizons on Education Inspired by Information and Communication Technologies. *Procedia - Social and Behavioral Sciences*, 174, 602–608. <https://doi.org/10.1016/j.sbspro.2015.01.589>
- Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 12(24), 10367. <https://doi.org/10.3390/su122410367>

- Daryanes, F., Darmadi, D., Fikri, K., Sayuti, I., Rusandi, M. A., & Situmorang, D. D. B. (2023). The development of articulate storyline interactive learning media based on case methods to train students' problem-solving ability. *Heliyon*, 9(4), e15082. <https://doi.org/10.1016/j.heliyon.2023.e15082>
- Gherheș, V., Stoian, C. E., Fărcașiu, M. A., & Stanici, M. (2021). E-Learning vs. Face-To-Face Learning: Analyzing Students' Preferences and Behaviors. *Sustainability*, 13(8), 4381. <https://doi.org/10.3390/su13084381>
- 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>
- Le, H., Janssen, J., & Wubbels, T. (2018). Collaborative learning practices: Teacher and student perceived obstacles to effective student collaboration. *Cambridge Journal of Education*, 48(1), 103–122. <https://doi.org/10.1080/0305764X.2016.1259389>
- Marpanaji, E., Mahali, M. I., & Putra, R. A. S. (2018). Survey on How to Select and Develop Learning Media Conducted by Teacher Professional Education Participants. *Journal of Physics: Conference Series*, 1140, 012014. <https://doi.org/10.1088/1742-6596/1140/1/012014>
- Mayang Sari, S., Zikri Ma'arij, M., & Roza Adila, D. (2023). The Effectiveness of Multimedia-based Learning Media on the Achievement of Health Students' Competences: A Literature Study. *KnE Medicine*. <https://doi.org/10.18502/kme.v3i1.12695>
- Ng, D. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2023). Teachers' AI digital competencies and twenty-first-century skills in the post-pandemic world. *Educational Technology Research and Development*, 71(1), 137–161. <https://doi.org/10.1007/s11423-023-10203-6>
- Nguyen, L. T., Kanjug, I., Lowatcharin, G., Manakul, T., Poonpon, K., Sarakorn, W., Somabut, A., Srisawasdi, N., Traiyarach, S., & Tuamsuk, K. (2022). How teachers manage their classroom in the digital learning environment – experiences from the University Smart Learning Project. *Heliyon*, 8(10), e10817. <https://doi.org/10.1016/j.heliyon.2022.e10817>
- Palioura, M., & Dimoulas, C. (2022). Digital Storytelling in Education: A Transmedia Integration Approach for the Non-Developers. *Education Sciences*, 12(8), 559. <https://doi.org/10.3390/educsci12080559>
- Paul, J., & Jefferson, F. (2019). A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course From 2009 to 2016. *Frontiers in Computer Science*, 1, 7. <https://doi.org/10.3389/fcomp.2019.00007>
- Saepuloh, D., Sabur, A., Lestari, S., & Mukhlisoh, S. U. (2021). Improving Students' Critical Thinking and Self-Efficacy by Learning Higher Order Thinking Skills Through Problem-Based Learning Models. *JPI (Jurnal Pendidikan Indonesia)*, 10(3), 495. <https://doi.org/10.23887/jpi-undiksha.v10i3.31029>
- Scheel, L., Vladova, G., & Ullrich, A. (2022). The influence of digital competencies, self-organization, and independent learning abilities on students' acceptance of digital learning. *International Journal of Educational Technology in Higher Education*, 19(1), 44. <https://doi.org/10.1186/s41239-022-00350-w>
- Schindler, L. A., Burkholder, G. J., Morad, O. A., & Marsh, C. (2017). Computer-based technology and student engagement: A critical review of the literature. *International Journal of Educational Technology in Higher Education*, 14(1), 25. <https://doi.org/10.1186/s41239-017-0063-0>
- Supriasih, E., Fathurohman, A., & Sriyanti, I. (2022). Analysis of Students' Self-Regulated Learning Using Augmented Reality Media on Solar System Material at Class VII SMP. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, 12(2). <https://doi.org/10.30998/formatif.v12i2.13677>