

The Effectiveness of Multimedia-Based Learning To Accelerate Learning After The Pandemic At The Basic Education Level

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Abstract

Keywords:

Effectiveness,
Multimedia,
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Elementary School,
Post-Pandemic.

This study discusses multimedia's effectiveness for accelerated or post-pandemic low learning at the elementary school level. Very few data findings discuss the effectiveness of post-pandemic technology-based learning. An electronic data search will be carried out on various literature related to the two variables above to overcome this problem. Next, we analyze the data using a phenomenological approach that involves a deep data coding system and high integration and ends with the principle of high validity to answer the issues and problems we have formed above. After going through a series of studies and presentation of existing data, this study is believed to have produced several findings, including the application of multimedia for the elementary level, efforts to accelerate learning loss due to the impact of the Pandemic have proven to be able to provide several conveniences and be innovative in its implementation. The reason is that multimedia attracts learners and allows learning to find new things that cannot be done manually. These findings will be the best contribution to the development of multimedia learning for post-pandemic elementary schools.

Abstrak

Kata kunci:

Efektifitas,
Multimedia,
Percepatan Belajar,
Sekolah Dasar,
Pascapandemi

Kajian ini membahas tentang efektivitas multimedia untuk pembelajaran akselerasi atau pembelajaran rendah pascapandemi di tingkat sekolah dasar. Sangat sedikit temuan data yang membahas keefektifan pembelajaran berbasis teknologi pasca pandemi. Pencarian data secara elektronik akan dilakukan pada berbagai literatur yang berkaitan dengan kedua variabel di atas untuk mengatasi masalah ini. Selanjutnya, kami menganalisis data menggunakan pendekatan fenomenologis yang melibatkan sistem pengkodean data yang mendalam, integrasi yang tinggi, dan diakhiri dengan prinsip validitas tinggi untuk menjawab isu dan permasalahan yang telah kami bentuk di atas. Setelah melalui serangkaian kajian dan pemaparan data yang ada, kajian ini diyakini telah menghasilkan beberapa temuan antara lain penerapan multimedia untuk tingkat SD, upaya percepatan learning loss akibat dampak Pandemi terbukti mampu memberikan beberapa kemudahan dan inovatif dalam pelaksanaannya. Alasannya adalah multimedia menarik pembelajar dan memungkinkan pembelajaran menemukan hal-hal baru yang tidak dapat dilakukan secara manual. Temuan ini akan menjadi sumbangsih terbaik bagi pengembangan pembelajaran multimedia untuk sekolah dasar pasca pandemi

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INTRODUCTION

Developing various learning strategies and approaches is urgently needed to progress post-pandemic disruption education in Indonesia.¹ This is in line with and left behind when the Pandemic hit education, especially the primary education system where the distance learning approach was less effective than teaching adult children.² So acceleration changes are essential to achieve the primary education system. Many findings suggest that multimedia solutions in the classroom signify an excellent school. Various approaches and data are available to achieve the goals that quality schools must meet following established policies. In general, the use of multiple forms of multimedia to convey information is the best method. Music videos, for example, are an example of multimedia because they combine video and audio. Multimedia comes from the word media and multi. Multi comes from the Latin word for "number," which means "many." The term "media" comes from Latin and refers to an intermediary or something used to convey or transport something. There are several advantages of multimedia education compared to other media forms.³

The benefits of multimedia learning, in general, include making the learning process more exciting and participatory, lowering learning time, boosting student learning quality, and increasing student interest and motivation⁴. Using multimedia can help students learn more effectively and efficiently and spend time more effectively and efficiently. Also, learning using multimedia will significantly boost student learning motivation. At the same time, higher motivation leads to more optimum success. The goal of multimedia is to deliver information to the audience clearly and thoroughly. Graphic, audio, visual, and animation components will help to clarify the content. The following are some of the functions of multimedia in everyday life. In the learning process section, of course, a teacher must use various learning resources and learning media so that students can easily understand the material; the learning process can run well and be attractive. It can attract their attention with the color or shape presented; it is expected to introduce students' curiosity about the material presented. Overcome Information Limitations, and create interactive and innovative learning.

¹ Sri Mulyani Indrawati and Ari Kuncoro, "Improving Competitiveness through Vocational and Higher Education: Indonesia's Vision for Human Capital Development in 2019-2024," *Bulletin of Indonesian Economic Studies* 57, no. 1 (2021): 29-59. Purniadi Putra et al., "The Students Learning from Home Experiences during Covid-19 School Closures Policy In Indonesia," *Jurnal Iqra' : Kajian Ilmu Pendidikan* 5, no. 2 (September 5, 2020): 30-42, <https://doi.org/10.25217/ji.v5i2.1019>.

² Ara Hidayat, "Post-Pandemic Education Study: Analysis of Resources, Opportunities, and Challenges of Madrasah Education in Indonesia," *Journal of Positive School Psychology*, July 2, 2022, 7342-54. Aslan Aslan et al., 'Teacher's Leadership Teaching Strategy Supporting Student Learning During The Covid-19 Disruption', *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam* 5, no. 3 (November 21, 2020): 321-33, <https://doi.org/10.31538/ndh.v5i3.984>. M. S. Nugraha, R. Liow, and F. Evly, "The Identification of Online Strategy Learning Results While Students Learn from Home During the Disruption of the COVID-19 Pandemic in Indonesia," *Journal of Contemporary Issues in Business and Government* 27, no. 2 (2021): 1950-56.

³ Nan Guan, Jianxi Song, and Dongmei Li, "On the Advantages of Computer Multimedia-Aided English Teaching," *Procedia Computer Science*, Recent Advancement in Information and Communication Technology: 131 (January 1, 2018): 727-32, <https://doi.org/10.1016/j.procs.2018.04.317>.

Learning with the help of the Internet is part of learning how multimedia is a network-assisted learning system that gets its information from satellites. When data is distributed or searched for, things are simple, fast, and cheap; consequently, anything obtained from the Internet can be utilized as a learning resource. People can connect, share information, and communicate via the Internet.⁴ The Internet is a world apart and boundless because of the vast amount of information and activity it contains. Software and hardware are also required for the Internet to function correctly and facilitate the dissemination and search of knowledge. According to Bingham & Conner,⁵ Internet technology can help reach many students and generate or develop new values.

The use of multimedia can help students learn more effectively and efficiently, as well as spend time more effectively and efficiently.⁶ Furthermore, learning using multimedia will significantly boost student learning motivation. At the same time, higher motivation leads to more optimum success. Multimedia Learning Functions The advantages of instructional media in the learning process include the following; 1) creating solid foundations in thinking to reduce 'verbalism.', 2) increasing student engagement, 3) Making classes more enjoyable so that the influence on learning outcomes is fulfilling.⁷

The designed interactive learning multimedia benefits include: 1) clarifying information with fascinating visuals and animations, 2) practicing abilities with various attempting activities, and 3) inspiring students with various praise.) allowing users to choose information based on their requirements, particularly if the curriculum has allowed independence in learning since the epidemic ravaged Indonesian education. To summarize, multimedia is employed in learning since it can increase sensory abilities and attract attention and interest in learning. According to Computer Technology Research (CTR), humans can only recall 20% of what they see and 30% of what they hear.⁸

Covid-19 has affected the technological transition in Indonesia, notably at the primary school level¹¹. During the COVID-19 Pandemic, information technology is essential for online or distance learning, enabling students to study quicker, smarter, and better.⁹ Another phrase is information and communication technology (ICT).

⁴ Sawsan Abdulrahman et al., "A Survey on Federated Learning: The Journey From Centralized to Distributed On-Site Learning and Beyond," *IEEE Internet of Things Journal* 8, no. 7 (April 2021): 5476–97, <https://doi.org/10.1109/JIOT.2020.3030072>.

⁵ Tony Bingham and Marcia Conner, *The New Social Learning: A Guide to Transforming Organizations Through Social Media* (Berrett-Koehler Publishers, 2010).

⁶ Abbas Pourhosein Gilakjani, "The Significant Role of Multimedia in Motivating EFL Learners' Interest in English Language Learning," *International Journal of Modern Education & Computer Science* 4, no. 4 (2012).

⁷ Guido Makransky and Richard E. Mayer, "Benefits of Taking a Virtual Field Trip in Immersive Virtual Reality: Evidence for the Immersion Principle in Multimedia Learning," *Educational Psychology Review* 34, no. 3 (September 1, 2022): 1771–98, <https://doi.org/10.1007/s10648-022-09675-4>.

⁸ Tung-Ju Wu and Yu-Nan Tai, "Effects of Multimedia Information Technology Integrated Multi-Sensory Instruction on Students' Learning Motivation and Outcome," *Eurasia Journal of Mathematics, Science, and Technology Education* 12, no. 4 (March 13, 2016): 1065–74, <https://doi.org/10.12973/eurasia.2016.1552a>.

⁹ Yulita Pujilestari, "Dampak Positif Pembelajaran Online Dalam Sistem Pendidikan Indonesia Pasca Pandemi Covid-19," *Adalah* 4, no. 1 (2020): 49–56. Sardjana Orba Manullang, Mardani Mardani, and Aslan

Incorporating information and communication technology (ICT) into the school system, according to Adel, Gawdy, and others, may result in several sound effects, including enhanced educational equity, improved learning outcomes, and teacher professionalism. Digital individuals and information technology knowledgeable have enough ICT literacy, according to Tesi Muskania and Wilujeng.¹⁰ Teachers must have appropriate ICT literacy to assist learning to integrate online properly and remote learning, which necessitates specific teaching to improve their ICT.¹⁴ Implementing e-learning allows students to complete learning activities from any location at any time.¹⁶

Furthermore, students can contribute comprehensive perspectives. Using multimedia, teachers, and students will learn a lot about things they did not know previously. This is because some of the subject matter available in e-learning has yet to be available in print media, such as books, commonly used in traditional teaching and learning techniques¹⁸. In contrast, face-to-face learning is accomplished via the reading of books.¹¹ This study aims to describe the use of multimedia and the acceleration of learning for elementary school students after the COVID-19 Pandemic, which has led to digital transformation in Indonesia and primary education.¹² The learning system has become more engaging and inventive. In order to achieve learning breakthroughs, teachers must continually be creative and imaginative; a) To meet learning objectives, mix text, pictures, audio, music, animated images, or videos into a cohesive entity; b) Capable of instilling a feeling of enjoyment in the learning process. This will improve student motivation throughout classroom learning to achieve maximum learning objectives; c) Capable of visualizing previously complex content to express merely using standard explanations or teaching tools; d) Relatively simple and adaptable storage media.¹³

RESEARCH METHOD

This study examines the effectiveness of multimedia-based learning in efforts to accelerate learning in post-pandemic elementary schools.¹⁴ Learning during a pandemic is synonymous with technology-based learning because learning must be responded to remotely after the public policy prohibiting gatherings or conventional face-to-face

Aslan, "The Effectiveness of Al-Quran Memorization Methods for Millennials Santri During Covid-19 in Indonesia," *Nazhruna: Jurnal Pendidikan Islam* 4, no. 2 (2021): 195–207.

¹⁰ Ricka Tesi Muskania and Insih Wilujeng, 'Pengembangan Perangkat Pembelajaran Project-Based Learning Untuk Membekali Foundational Knowledge Dan Meningkatkan Scientific Literacy', *Jurnal Cakrawala Pendidikan* 36, no. 1 (22 February 2017): 34–43, <https://doi.org/10.21831/cp.v36i1.8830>.

¹¹ Farahiza Zaihan Azizan, "Blended Learning in Higher Education Institution in Malaysia," in *Proceedings of Regional Conference on Knowledge Integration in ICT*, vol. 10, 2010, 454–66.

¹² Hermanto Hermanto, Zulela Ms, and Muhammad Japar, "Emergency Remote Learning during the COVID-19 Pandemic: Perspectives of Elementary Schools in Rural Area of Indonesia," *Journal of Educational Management and Instruction (JEMIN)* 2, no. 1 (2022): 55–62.

¹³ Maila D. H. Rahiem, "The Emergency Remote Learning Experience of University Students in Indonesia amidst the COVID-19 Crisis," *International Journal of Learning, Teaching and Educational Research* 19, no. 6 (June 30, 2020): 1–26.

¹⁴ Debolina Adhya and Santosh Panda, "Teacher Educators' Attitude towards Technology-Enabled Learning and Its Incorporation into Teaching-Learning during and Post-Pandemic," *Educational Media International* 59, no. 2 (April 3, 2022): 131–49, <https://doi.org/10.1080/09523987.2022.2101204>.

learning in one room. However, after the Pandemic, when schools are back to normal, many have forgotten how effective multimedia-assisted learning is, especially in elementary schools—trying to get some scientific evidence that wood admits that multimedia has contributed to the effectiveness of post-pandemic learning at the elementary school level.¹⁵ To prove whether multimedia's effectiveness provides accelerated learning, we have created a series of evidence from various literature in several publications that actively discuss the multimedia acceleration of learning and education, which the pandemic crisis has disrupted.¹⁶ We analyze under a phenomenological approach involving in-depth data coding techniques and thorough evaluation of compelling data interpretation themes to obtain valid research results in high validity, answering hypotheses and problems. We conducted a virtual data search, which we targeted in publications in the last ten years where the effectiveness of technology, according to various reports, was stated to have a significant impact on the acceleration of learning. Multimedia acceleration of learning for elementary schools after the pandemic response ended. This includes the methodology and materials used in conducting this secondary data study.¹⁷

RESULT AND DISCUSSION

Result

In the following, we summarize the effectiveness of using multimedia, which we summarize from various literary sources. To corroborate this finding, we quote various citations, which are the findings of previous studies which prove the importance of multimedia applications among students during learning that the Pandemic has disrupted. It must be admitted that multimedia-based learning is a relevant learning strategy to support a class of students whose age is still in elementary school. Moreover, during the Pandemic, children were sent home. Their parents should have needed support from various learning patterns and approaches so that students would continue to be motivated, considering that the Pandemic was a tough time, especially for elementary school-age children.

Figure 1. The findings summary; effectivity of multimedia and accelerated learning

Findings	Effectivity of multimedia	Accelerated learning
Multimedia to escalate learning	Multimedia technology enhances the educational process through increasing interaction between teachers, students, and courseware and by	The advantages include faster learning, less work, and a more delightful experience for children with different learning styles and subject areas

¹⁵ Daum, D. N, Goad, T., Mosier, B, and Killian, C. M., *Toward Quality Online Physical Education: Research Questions and Future Directions. International Journal of Kinesiology in Higher Education*, 1–13., 2021.

¹⁶ Haradhan Kumar Mohajan, "Qualitative Research Methodology in Social Sciences and Related Subjects," *Journal of Economic Development, Environment and People* 7, no. 1 (2018): 23–48.

¹⁷ Maura Deegan and Louise Terry, "Student Midwives' Perceptions of Real-Time Simulation: A Qualitative Phenomenological Study," *British Journal of Midwifery* 21, no. 8 (August 2013): 590–98, <https://doi.org/10.12968/bjom.2013.21.8.590>.

	<p>developing new techniques to make learning more dynamic, durable, and applicable to the world outside the classroom.</p>	<p>from primary to secondary school using multimedia.</p>
<p>Multimedia application in primary education</p>	<p>Text-to-teach, online games, and podcasts are today's favorite teaching tools. Digital learning materials help learners improve their mental representations through various media.</p>	<p>The benefits of using multimedia learning, in general, are making and accelerating the learning process more enjoyable and interactive, reducing the amount of learning time, improving the quality of student learning, and the learning process can grow student interest and motivation.</p>
<p>Covid School Closures and Unfinished Learning</p>	<p>This method of presenting material helps students understand learning material comprehensively and concretely during distance learning because it is presented with contextual examples.</p>	<p>Learning loss can be solved by supporting students to learn using multimedia at home. Some education experts and the surrounding community support the distance learning policy through technology.</p>
<p>Interactive multimedia in learning in primary school</p>	<p>Primary school teachers are challenged to create computer-based teaching tools that assist economic learning. Due to restricted knowledge and abilities, only a few teachers with a background in economics can create online resources for primary school students using the Internet to learn about the real-world economy.</p>	<p>Teachers and students communicate effectively with media in the classroom. Multimedia can motivate, inspire and engage students in learning activities and even psychologically influence them.</p>

Post-pandemic multimedia transformation	The Covid-19 Pandemic has had many negative impacts, including social distancing. Accelerating schools' digital transformation and supporting ecosystems is critical for long-term success.	The multimedia revolution is both an opportunity and a challenge. It is replacing traditional methods and study habits with new ones that are more effective and efficient.
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Source: Processing, 2023

Discussion

Multimedia to escalate learning

Educational technologists nowadays often employ and discuss multimedia issues. If not correctly defined, it is a mix of multiple mass media such as text, audio, and video" or the mass manufacturing of computer-based hardware and software packages. However, individual usage and learning" are two alternate definitions. In these cases, item technology necessitates more than the use of high-end gadgets such as computers, interactive whiteboards, and cell phones; Internet and mobile devices are also included., Wi-fi, YouTube, and so on, while widely preferred by today's students for their learning potential, also include a practical and better learning management system, information dissemination scheme, teaching and management mass effective student learning, feedback mechanisms, and performance monitoring.¹⁸ Multimedia provides distinct benefits in teaching and is an effective presenting tool. This experience requires graphics, video, and audio to be displayed simultaneously rather than sequentially. It also allows us to give way for students to experience their topic, similar to what they would experience in real life.¹⁹ In teacher-centered approaches, information is processed through demonstrations and presentations. Students can also master a subject and retain and recall the information thanks to highly interactive drills, practices, and tutorials.²⁰

In a networked classroom, the multimedia courseware can also be disseminated on CD-ROM in a teacher-centered mode, with students accessing the courseware on their computers and following the instructor's lectures.²¹ In the student-centered method, the teacher is a facilitator, allowing students to deepen their knowledge and

¹⁸ David Nicol, "From Monologue to Dialogue: Improving Written Feedback Processes in Mass Higher Education," *Assessment & Evaluation in Higher Education* 35, no. 5 (August 1, 2010): 501-17, <https://doi.org/10.1080/02602931003786559>.

¹⁹ Hilal Almarabeh, Ehab Amer, and Amjad Sulieman, "The Effectiveness of Multimedia Learning Tools in Education," *International Journal of Advanced Research in Computer Science and Software Engineering* 5 (December 22, 2015): 761.

²⁰ Abbas Pourhosein Gilakjani, "The Significant Role of Multimedia in Motivating EFL Learners' Interest in English Language Learning.," *International Journal of Modern Education & Computer Science* 4, no. 4 (2012).

²¹ Juan Lv, "Research of Japanese Translation Teaching Based on Multimedia Network Technology," *Journal of Computational and Theoretical Nanoscience* 13, no. 12 (December 1, 2016): 10375-79, <https://doi.org/10.1166/jctn.2016.6168>.

incorporate real-world experiences into the learning process. The audiovisual material of the courseware can also be provided online as a web file using a web browser. Students in online courses can so access the courseware through a browser. The learning environment is student-centered since students may learn at their speed and in their place. The same multimedia courseware content may be packaged and supplied here for remote learning through broadband and satellite technologies. During this time, students learn at their speed and in their place via real-time videoconferencing with the instructor.²²

Multimedia application in primary education

Learning videos may be regarded as media used to engage students' thoughts, feelings, and willingness to learn by exhibiting concepts or ideas, messages, and information audio-visually such that data promotes the construction of the intended quality of learning.²³ Thematic is a subject that plays a vital role in other fields of study; it is hoped that students will appreciate the importance of thematics more and be interested in learning it. To gain the goals of teaching thematic learning, it is necessary to have an active process to motivate students to study Thematic and improve their achievements. So teaching is not a momentary goal, but good cooperation in all aspects continuously. Thematic combines exact science, reason, and imagination with transparent and integrated work steps. Students who cannot enter due to permission may be left behind in the following thematic lessons. Also, students who need to be on time in understanding the material will need help understanding the following related material. This harms students and affects their achievements.²⁴

Ultimately, the problem in this service is how the implementation and feasibility of learning videos on thematic subjects for the 2020 school year were developed at Partner's place. Teachers should: a) create a pleasant online learning environment; b) discuss the previously studied and developed competencies about the competencies that will be studied and developed; c) convey the competencies to be achieved and their benefits in everyday life; and d) convey an outline of the scope of material and activities to be carried out. e) describe the scope and assessment methods utilized.²⁵ Using a mixed media approach, the understudy may incorporate homemade film clips of these critters into a report. After adding titles and credits, the understudy has a novel and one-of-a-kind technique for communicating their unique point of view. A college instructor

²² Elizabeth Murphy, María A. Rodríguez-Manzanares, and Michael Barbour, "Asynchronous and Synchronous Online Teaching: Perspectives of Canadian High School Distance Education Teachers," *British Journal of Educational Technology* 42, no. 4 (2011): 583-91.

²³ Tsung juang Wang, "Educational Benefits of Multimedia Skills Training," *TechTrends* 54, no. 1 (January 1, 2010): 47-57, <https://doi.org/10.1007/s11528-009-0363-x>.

²⁴ Michael D. Hanus and Jesse Fox, "Assessing the Effects of Gamification in the Classroom: A Longitudinal Study on Intrinsic Motivation, Social Comparison, Satisfaction, Effort, and Academic Performance," *Computers & Education* 80 (January 1, 2015): 152-61, <https://doi.org/10.1016/j.compedu.2014.08.019>.

²⁵ Georga J. Longhurst et al., "Strength, Weakness, Opportunity, Threat (SWOT) Analysis of the Adaptations to Anatomical Education in the United Kingdom and the Republic of Ireland in Response to the Covid-19 Pandemic," *Anatomical Sciences Education* 13, no. 3 (2020): 301-11.

might also use a video and audio Compact disc to plan, update, or educate to teach and add comprehension to their advice, depending on the nature of the course. Operations, emergency treatment instructions, and, unexpectedly, doctors' or, conversely, paramedics' directives are energetic and precise when using sight and sound.²⁶

Covid School Closures and Unfinished Learning

According to the Annenberg Institute at Brown University, the "loss of students' educational gains" during the summer is called lesson loss. The outcomes of the seasonal learning studies reveal three repeating themes: Typically, achievement slows or drops over the summer, with upper grades seeing a greater extent (percentage of loss) and sharper declines in math than in reading.²⁷ According to Kuhfeld et al., students concluded the 2019-20 school year with around 63-68% of average advances in reading and 37-50% in mathematics.²⁸ Further range forecasts detailed subject-specific variability for the low grade based on the study. Despite reading having many potential outcomes, most children display learning slides in mathematics throughout the lengthy closure and summer time. Despite their severe nature, these forecasts anticipated that pupils would be unable to obtain teaching during school closures; this is the reality for many underprivileged students.²⁹

Interactive multimedia in learning in primary school

Utilization of various media sources, one of which is interactive multimedia, is expected to increase teacher creativity in implementing the economics learning process. However, only a few teachers with an educational background in economics can develop computer-based teaching materials due to limited knowledge and skills.³⁰ Primary school learning is often carried out using conventional teacher-centered methods. This causes students to be less interested in the material presented. According to Gerlach and Ely in Almarabeh et al.,³¹ "media, when generally defined, is human, material, or event-based settings that enable students to acquire information, skills, or attitudes." Learning media is a conduit for transmitting learning messages.³²

²⁶ Almarabeh, Amer, and Sulieman, "The Effectiveness of Multimedia Learning Tools in Education."

²⁷ Melissa Lambert and Joseph Sassone, "Accelerate, Do not Remediate: An Instructional Framework for Meeting the Needs of the Most Vulnerable Students after COVID School Closures," *Journal for Leadership and Instruction* 19, no. 2 (2020): 8-13.

²⁸ Megan Kuhfeld et al., "Projecting the Potential Impact of COVID-19 School Closures on Academic Achievement," *Educational Researcher* 49, no. 8 (November 1, 2020): 549-65, <https://doi.org/10.3102/0013189X20965918>.

²⁹ Kuhfeld et al.

³⁰ Sawsan Nusir et al., "Designing an Interactive Multimedia Learning System for the Children of Primary Schools in Jordan," in *2011 IEEE Global Engineering Education Conference (EDUCON)*, 2011, 45-51, <https://doi.org/10.1109/EDUCON.2011.5773111>.

³¹ Almarabeh, Amer, and Sulieman, "The Effectiveness of Multimedia Learning Tools in Education."

³² Dwi Yuniasih Saputri, Rukayah Rukayah, and Mintasih Indriayu, "Need Assessment of Interactive Multimedia Based on Game in Elementary School: A Challenge into Learning in the 21st Century," *International Journal of Educational Research Review* 3, no. 3 (July 1, 2018): 1-8, <https://doi.org/10.24331/ijere.411329>.

Media will be helpful only if instructors and students interact well. Advances in communication and technology necessitate the employment of more inventive and creative learning material in schools. Learning media are employed in four ways in the teaching and learning process, according to Puspitarini and Hanif.³³; 1) ensuring that messages are conveyed in a nonverbal manner; 2) overcoming the restrictions of space, time, and sensory power; 3) adopting suitable and varied learning media may overcome students' passive attitude; and 4) Every learner should be exposed to the same stimuli, experiences, and perspectives. Learning media in the classroom may spark students' aspirations and interests, encourage them, engage them in learning tasks, and even impact them psychologically. Students' understanding can be improved by presenting them with fascinating and credible info via learning media. Effective learning requires planning both in terms of media and other supporting elements. For learning media to provide optimal results, several things must be considered in selecting media.³⁴

Some of these factors, according to El Mhouthi et al.,³⁵ Include (1) accuracy with learning objectives, (2) support for the substance of learning materials, (3) ease of getting media, (4) teacher's talents in communicating ideas, and (5) Appropriate with the level of student thinking. Learning media as a means of conveying messages should be adapted to the characteristics of the material and follow the conditions and needs of the learning process in schools. According to Kuhfeld et al.,³⁶ In the educational process, what is meant by needs is the gap between the abilities, skills, and attitudes of students they already have. If the material students must learn is very much, then the limited meeting time can also be a problem. Therefore, the learning process requires tools in the form of learning media.³⁷

Post-pandemic multimedia transformation

In a broad sense, the moment of national awakening is an invitation to unite to rise nationally from the nation's problems. In the context of school education, it implies the inevitable social disruption of the Covid-19 Pandemic, including the problem of various forms of outreach, access, and acceptance of learning.³⁸ However, various pioneering efforts are still being made. Accelerating the digital transformation of schools and their supporting ecosystems by recognizing the two-year pandemic moment, the

³³ Puspitarini and Hanif, "Using Learning Media to Increase Learning Motivation in Elementary School."

³⁴ Winarto Winarto, Ahmad Syahid, and Fatimah Saguni, 'Effectiveness the Use of Audio Visual Media in Teaching Islamic Religious Education,' *International Journal Of Contemporary Islamic Education* 2, no. 1 (August 1, 2020): 81–107, <https://doi.org/10.24239/ijcied.Vol2.Iss1.14>.

³⁵ Abderrahim El Mhouthi, Azeddine Nasseh, and Mohamed Erradi, 'How to Evaluate the Quality of Digital Learning Resources?', *International Journal Of Computer Science Research And Application* ISSN 2012-9564 (Print) ISSN 2012-9572 (Online) 03 (September 1, 2013): 27–36.

³⁶ Kuhfeld et al., "Projecting the Potential Impact of COVID-19 School Closures on Academic Achievement."

³⁷ Eric M. Meyers, Ingrid Erickson, and Ruth V. Small, "Digital Literacy and Informal Learning Environments: An Introduction," *Learning, Media, and Technology* 38, no. 4 (December 1, 2013): 355–67, <https://doi.org/10.1080/17439884.2013.783597>

³⁸ Kadek Hengki Primayana, I. Wayan Lasmawan, and Putu Budi Adnyana, 'Pengaruh Model Pembelajaran Kontekstual Berbasis Lingkungan Terhadap Hasil Belajar Ipa Ditinjau Dari Minat Outdoor Pada Siswa Kelas IV', *Jurnal Pendidikan dan Pembelajaran IPA Indonesia* 9, no. 2 (30 May 2019): 72–79.

dynamics of various technology breakthroughs, and the need to close gaps (gaps) in access to school learning.³⁹ A digital transformation is a complex change in a business or organization, encompassing everything from human resources, procedures, strategy, and structure to using technology to boost performance.⁴⁰

Infrastructure and technology are required as a result of digital transformation. Learning methods embedded with technology require the proper IT infrastructure and platform for implementation.⁴¹ Media transformation can be understood as the process of using digital technology that is already available. Examples include cloud computing, virtualization technologies, mobile computers, and other media.⁴²

Furthermore, digital transformation is "a process that tries to enhance entities by causing major changes in their features via the use of a mix of information, processing, communication, and networking technologies."⁴³ In education, the multimedia revolution is both an opportunity and a challenge. Rapid technological advancements have brought digital transformation into ordinary human life. Whether we like it or not, humanity must continue to adapt to technological advances.⁴⁴ One of them is in the educational field. This digital and multimedia change is progressively replacing traditional methods and study habits with new ones that are more effective and efficient in the educational process.⁴⁵ Introducing new technology, representing the beginning of this digital transition, will provide fresh air to human life. Progress in the increasingly complex digital world, including education, is continuing. This digital shift will have far-reaching consequences in the field of education. Learning activities have become more accessible and adaptable to undertake as a result of the digital revolution.

As instructors and students track, study, document, and resume class content on demand, this digital transformation will also assist in modifying human behavior. Given the current state of affairs, it is impossible to deny that the media revolution brings both possibilities and difficulties to education.⁴⁶

³⁹ Audry Putri Callista and Marudut Bernadtua Simanjuntak, "Analysis Life Values From Habibie And Ainun Novels," *LITERACY: International Scientific Journals of Social, Education, Humanities* 1, no. 2 (August 20, 2022): 33–44, <https://doi.org/10.56910/literacy.v1i2.213>.

⁴⁰ Aang Royyana, "Strategi transformasi digital pada pt. Kimia farma (persero) tbk," *Journal of Information Systems for Public Health* 5, no. 2 (October 21, 2021): 15–32, <https://doi.org/10.22146/jisph.34179>.

⁴¹ Blanca Martínez de Aragón, Jesus Alonso-Zarate, and Andres Laya, "How Connectivity Is Transforming the Automotive Ecosystem," *Internet Technology Letters* 1, no. 1 (2018): e14.

⁴² John Loonam and Nicholas O'Regan, "Global Value Chains and Digital Platforms: Implications for Strategy," *Strategic Change* 31, no. 1 (2022): 161–77.

⁴³ Gregory Vial, "Understanding Digital Transformation: A Review and a Research Agenda," *Managing Digital Transformation*, 2021, 13–66.

⁴⁴ Michela Matarazzo et al., "Digital Transformation and Customer Value Creation in Made in Italy SMEs: A Dynamic Capabilities Perspective," *Journal of Business Research* 123 (February 1, 2021): 642–56, <https://doi.org/10.1016/j.jbusres.2020.10.033>.

⁴⁵ Thomas Hess et al., "Options for Formulating a Digital Transformation Strategy," in *Strategic Information Management* (Routledge, 2020), 151–73.

⁴⁶ Yogesh K. Dwivedi et al., "Impact of COVID-19 Pandemic on Information Management Research and Practice: Transforming Education, Work and Life," *International Journal of Information Management, Impact of COVID-19 Pandemic on Information Management Research and Practice: Editorial Perspectives*, 55 (December 1, 2020): 102211, <https://doi.org/10.1016/j.ijinfomgt.2020.102211>.

Talking about the challenges the world of education is facing, digital transformation can pose many challenges. One of the current challenges is online learning in recent years due to the Covid-19 Pandemic.⁴⁷ A pandemic has forced the education world, schools, and universities, to adapt. Of course, the paradigm shift from traditional to online learning goes hand in hand with the paradigm shift in academic culture, so it takes time. In addition, the need for more facilities, geographical location, economic problems, and the different mindsets of students living in urban and remote areas have become many challenges for the world of education facing the current digital transformation. Multimedia transformation, on the other hand, is not only a challenge for education but also an opportunity. Everyone should now study online. Whether they like it or not, students need aid to complete it, or they will feel foolish, yet they still require online learning.⁴⁸

In this section, we discuss the study's findings to understand the effects of multimedia-based learning activities in efforts to accelerate post-pandemic learning in the picture of elementary school education, as we mentioned in the results section where the application of multimedia as a post-pandemic learning support tool to accelerate learning to catch up is the ideal solution and is widely recommended by many field findings.⁴⁹ They stressed that the implementation of multimedia at the higher education level is nothing new but is becoming more interesting because of the desire for brawls at the elementary school level students like media with a variety of application models and other media. as well as manual media, such as understanding essential education exposure where student learning is still under 12 years of age who are happy to continue learning while playing with various multimedia models and have proven success.⁵⁰, about the schools who left behind due to school closing learning. However, continuing with distance classes is believed not to cover the gap if only relying on the learning system in face-to-face classes.

Our findings recommend that the addition of learning media from the Face-to-Face system by strengthening it with various interactive multimedia will be a special consideration when schools want to take new actions of change without following the directions and abilities of each school organization. A similar study was reported by Miller et al.,⁵¹ Who said multimedia was very appropriate to use during and after the Pandemic? In the final section, we mentioned that post-pandemic, the existence of

⁴⁷ Hugh McLaughlin, Helen Scholar, and Barbra Teater, "Social Work Education in a Global Pandemic: Strategies, Reflections, and Challenges," *Social Work Education* 39, no. 8 (November 16, 2020): 975–82, <https://doi.org/10.1080/02615479.2020.1834545>.

⁴⁸ Ishamuddin Mustapha et al., "Effectiveness of Digital Technology in Education During COVID-19 Pandemic. A Bibliometric Analysis," 136–154, April 2021, <https://doi.org/10.3991/ijim.v15i08.20415>.

⁴⁹ Csaba Deák et al., "Evolution of New Approaches in Pedagogy and STEM with Inquiry-Based Learning and Post-Pandemic Scenarios," *Education Sciences* 11, no. 7 (July 2021): 319, <https://doi.org/10.3390/educsci11070319>.

⁵⁰ Luca Rossetto et al., "Interactive Video Retrieval in the Age of Deep Learning – Detailed Evaluation of VBS 2019," *IEEE Transactions on Multimedia* 23 (2021): 243–56, <https://doi.org/10.1109/TMM.2020.2980944>.

⁵¹ Cynthia Miller et al., "Increasing Community College Graduation Rates with a Proven Model: Three-Year Results from the Accelerated Study in Associate Programs (ASAP) Ohio Demonstration," *MDRC* (MDRC, January 2020), <https://eric.ed.gov/?id=ED603027>.

multimedia has been able to provide a transformation of the learning system from a distance method to an indoor education method by relying on the presence of digital media, which is believed to be able to transform learning objectives to achieve the desired maximum results. Thus, among others, the results of the discussion we have reported from studies with the theme of weaknesses in multimedia-based learning in efforts to respond to learning lost after the pandemic response.⁵²

CONCLUSION

We can conclude from a series of studies examining various scientific evidence from the literature that discusses the issue of the effectiveness of multimedia-based learning to accelerate learning after education has been affected by the Pandemic. The impact of the Pandemic has seen a decline or learning loss worldwide, including in Indonesia. When education was reopened, there was a decrease in the habit of using technology because distance education had been discontinued and continued with face-to-face education in schools. Supported by existing evidence, we have succeeded in presenting scientific evidence of the usefulness and effectiveness of using multimedia to teach accelerated learning lag due to impact.

The following are the results; among other things, we found that multimedia is very relevant to accelerate learning affected by the Pandemic with various innovative technologies that have made learning more accessible, such as videos of the existence of wi-fi and various learning tools that make elementary school children improve learning. Based on the explanation, multimedia applications in elementary schools are the best solution because elementary school-age children need various animations of various learning models that make them continuously learn. However, many say that the transformation of the media will continue considering that the cruising range and ability to innovate maintenance results are evident not only during the Pandemic but also after the Pandemic has ended.

We realize that the findings of this study provide both advantages and weaknesses, which are our challenges going forward in terms of problem formulation, methods of taking and conducting studies, and final reporting. Future similar studies

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⁵² Binar Kurnia Prahani et al., "Implementation of Online Problem-Based Learning Assisted by Digital Book with 3D Animations to Improve Student's Physics Problem-Solving Skills in Magnetic Field Subject," *JOTSE* 12, no. 2 (2022): 379-96.

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