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The Role of Technology in Redesigning the Modern Education System

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Abstract

Technological advancements have played a vital role in redesigning the modern education system to be more adaptive, effective, and inclusive. However, despite rapid development, many educational institutions are still struggling to align with 21st-century competencies due to outdated pedagogical models. This study aims to explore the strategic role of educational technology in transforming modern educational systems, especially within the Indonesian context. Using a qualitative-descriptive method, the research is based on literature analysis of scholarly journals, policy documents, and expert opinions from the last decade. The sample consists of national and international literature relevant to educational technology integration. Findings reveal that the integration of technology in curriculum development, pedagogy, and institutional frameworks has contributed significantly to fostering critical thinking, independent learning, and mastery learning. The study also identifies key educational trends such as personalized learning, system-based approaches, and digital pedagogy. These findings underscore the significance of educational technology as a transformative force in enhancing the relevance and quality of education in the digital era.

Keywords: Educational Technology, Educational Transformation, Modern Educational System

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INTRODUCTION

Today and in the future, Indonesian society has a technological culture, meaning that technological development has taken place to such an extent that it has spread widely and influenced all areas of life, including education (Sianturi et al., 2022). Therefore, technology needs to be used more meaningfully and effectively in the field of education towards realizing the ideals of making the nation's life smarter (Mogas et al., 2022).

Communication and information technology development has progressed so rapidly that it has penetrated state boundaries and even sovereignty over territory. The flow of communication from developed countries is impossible to stem (Hidayat, 2024). The strategy that can be used to reduce the negative impact of the flow of communication and information is to strengthen the resilience of each member of society through education that utilizes the technology in question (Firdhous & Karuratane, 2018).

Recently, society, government, students, graduates, and educators have

scrutinized education. Unfortunately, the spotlight is not evenly distributed, so it illuminates all aspects of education but focuses only on certain factors. One of the focuses of the spotlight is educating people, particularly teachers and educational institutions. The sharp spotlight on teachers and their academic institutions may be based on the assumption that their role is decisive in educational development (Apriyanti et al., 2023).

So if they don't play a role, educational development will be hampered. This spotlight has concluded that they have not carried out their role well, and therefore receive priority for improvement. The submission of the National Education Bill should be possible expand and sharpen the focus of the spotlight on the entire education system (components, functions, objectives as well as organization and structure) and at the same time awaken awareness of all parties that our education system needs to be reorganized entirely in line with changing situations and conditions, as well as by future demands and expectations (Kurniawan & S Th I, 2017). Efforts to improve are therefore not carried out in a patchwork manner on certain elements only.

In the digital era, which continues to develop rapidly, education is one sector experiencing a significant impact, primarily through technology (Taruklimbong & Sihotang, 2023).

This journal paper aims to gain a deeper understanding of the concepts of educational technology and educational transformation. Apart from that, this article also aims to identify and analyze the strategic role of educational technology in encouraging transformation in educational systems and processes, both from pedagogical aspects, curriculum, and supporting infrastructure.

LITERATURE REVIEW

Understanding Educational Technology

Education is the most crucial investment for every nation, especially developing nations (Irianto, 2017). In the sense of the word, development can only be carried out by a nation prepared to build its country through education (Lase et al., 2024). Because, in essence, education is a reflection of a nation's civilization. A highly civilized nation is characterized by a relatively high level of education for its citizens. A high level of education depends on the quality of education, which is closely related to the teaching and learning process (Kurniawan & S Th I, 2017).

Nowadays, experts are trying to improve the teaching and learning process into a science or technology that can be known and mastered in steps. This is where the role of educational technology is vital (Wulandari et al., 2022). What is meant by educational technology? Initially, the definition of educational technology was the same as technology in education, namely, facilities that support teaching and learning activities, such as computers, overhead projectors, TV, video tape recorders, etc (Shareef & Nithyanantham, 2022). Then, based on current developments, there are several opinions about what educational technology means (Koesnandar, 2013).

According to the AECT (Association for Educational Communication and Technology) Definition and Terminology Commission, educational technology is

a complex and integrated process involving people, procedures, ideas, equipment, and organizations to analyze problems, find solutions, implement, evaluate, and manage problem-solving involving all aspects of human learning. On the other hand, some believe that educational technology is the development, application, and assessment of systems, techniques, and tools to improve and enhance the human learning process (Yaumi, 2016). The priority here is the learning process itself and the tools that can help the learning process. So, educational technology is about software and hardware. Software analyzes and designs learning sequences or steps based on the goals to be achieved with harmonious presentation methods, and assesses success (Mokalu et al., 2022). Meanwhile, the hardware is teaching aids, audiovisual aids, or instructional aids such as radio, opaque film projector, overhead projector, TV, video tape recorder, computer, etc. Some argue that educational technology is systematic thinking about education, the application of problem-solving methods in education, which can be done with modern communication tools or without these tools (Firmadani, 2020).

Another opinion says that educational technology is the study and practice of helping the learning process and improving performance by creating, using, and managing adequate technological processes and resources (Erwinsyah, 2016). From the opinions above, the definition of educational technology is a systematic and critical approach to education (the process of solving educational problems). The most basic education problems can be grouped into four types, namely: equity problems, quality problems, effectiveness and relevance problems, and efficiency problems. These are the problems that educational technology must be able to solve. For the problem of equal distribution of education in Indonesia, the government, with educational technology, is trying to overcome it by:

Conventional

1. build a school building
2. use the school building for morning and afternoon school (double shift system)

Innovative

1. Pamong system, namely a mass education system. In this system, Education is carried out by the community, parents, and teachers. Education starts from the family, where those who can teach those who cannot. This system was pioneered in Solo and disseminated to several other provinces, such as Riau.
2. Systems in remote areas. This system is the result of the development of the civil service system.
3. Visiting Teacher System.
4. The distance learning system is an educational effort to expand education outside the classroom. This is realized by having open junior high schools, high schools, and universities. Open here means open to everyone; that is, anyone, regardless of age, can register at an open school anytime. However, in practice, education with this system, where students learn using modules, is more suitable for employees who are used to being independent daily.
5. The educational television system uses television media to assist educational activities outside of school. TVRI periodically and regularly

broadcasts educational programs for school children.

Package A and B Pursuit System. We hope that in the future, educational technology can formulate a better and higher-quality education system for the academic progress of the Indonesian nation.

Educational Transformation

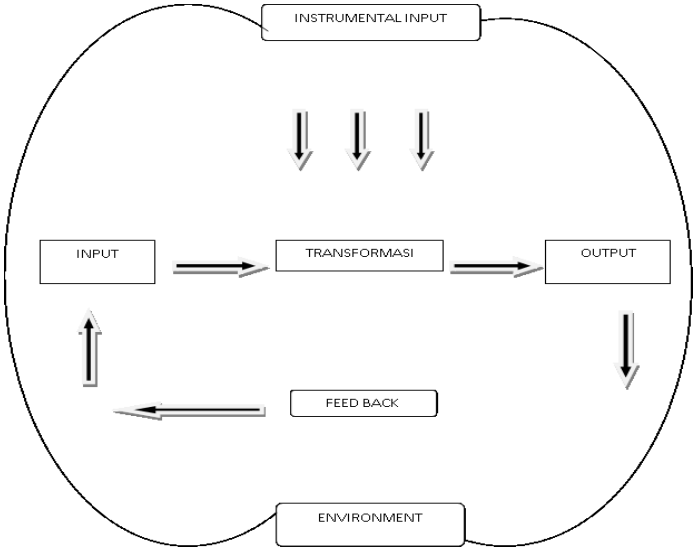

Figure 1. General education transformation system chart

METHODS

This research adopts a qualitative-descriptive approach aimed at exploring the conceptual and practical roles of technology in transforming modern educational systems. The study focuses on a literature-based analysis involving critical reviews of scholarly articles, books, and official reports related to educational technology, transformation models, and instructional design in the digital age. (Sugiyono, 2019)

The scope of this study covers the integration of technology in the domains of curriculum development, pedagogical practices, and institutional reform within the context of Indonesian education. The operational definitions in this research are derived from authoritative sources, including the Association for Educational Communications and Technology (AECT) and other reputable academic references.

The data were collected through document analysis, involving a systematic review of both national and international literature published within the last decade. Sources include academic journals indexed in Google Scholar, national education policy documents, and empirical findings related to the use of technology in education. The main research instruments used were thematic reading grids and annotation tools to code recurring patterns and key themes.

Data analysis was carried out using a thematic content analysis technique. These themes were interpreted to construct a comprehensive understanding of the

strategic role of technology in education. The analysis also triangulated theoretical perspectives with empirical evidence to ensure validity and enrich interpretative depth.

The findings presented are expected to offer conceptual clarity and practical recommendations for integrating technology into educational practices, particularly in vocational and general education settings in Indonesia.

RESULTS & DISCUSSION

Education in general aims to improve the quality of human life. (making tomorrow more perfect). A quality life is how people can live better than before. The educational process begins with instrumental input. What instrumental input means is the beginning of the input into education. There are also inputs such as the student education curriculum, which, as seen from the systematics above, are transferred/processed by superior staff/teachers by teaching standards in Indonesia. Then, from the overall processing, the results will be visible. Namely value. The more basic result is a learning system that shapes the whole person. Education is also able to produce superior, quality people.

All the systems and frameworks mentioned above cannot be separated from the role of the surrounding environment. The surrounding environment can also help transform educational knowledge. And the environment is also the place/object of the practice of academic science, which has various components. From all of the above, it can be concluded that the final result of a transformation of the education system is to make all aspects of education more effective so that the ultimate goal is to improve the quality of human life so that humans can manage themselves, gain access to work, live in a good living environment, be physically and spiritually healthy, have good fertilization and sanitation and be able to maximize their minds, all of which can be achieved well.

Discussion

Observed Symptoms

The education system in the last decade has experienced awe-inspiring growth. Basic education can be improved at the junior high school level for all Indonesian children. One of the assumptions underlying this expansion effort is that this increase in learning time will enhance the quality of the workforce. However, the content and implementation strategy must be questioned. We all know this rapid growth will have the opposite effect on quality. There are still many lay people, or even experts, who believe that the main task of education is to transfer knowledge from educators to participants.

Moreover, many facts show that what is transferred mainly includes cognitive aspects (memorizing, repeating, mentioning, and so on). There are indeed religious values that must be preserved, but in today's developments, more and more values, especially those originating from sensory truth and scientific truth, are changing, so they should not be preserved.

The organizational structure of education today is still the same as it was a

century ago, even though other sectors of life have changed. Formal education is manifested in the form of a school, standardized with a room limited by four walls, filled with several children of the same age, taught and supervised by a teacher. The teacher has sole authority in determining activities and assessing the results. As a result, various sources for learning that exist in society cannot be utilized. Teachers are considered the only teaching staff who have the authority to teach. Indeed, the current reality shows that the teacher is the sole authority in the teaching and learning process. Even today, teachers are burdened with many tasks they cannot carry out effectively.

The teacher's main task should be to "supervise, emulate and inspire enthusiasm" if the motto "Tut Wuri Handayani" is still used. We are all aware that science is developing continuously, and the amount and quality of information is growing exponentially. Someone can't control the increase in information by hoarding data or facts in their brain. However, what is happening now is adding new subjects or material to the curriculum. The development of science indeed requires us to learn more, faster, and more effectively. However, that doesn't mean that what we know has to be facts.

Technology has developed rapidly, and our culture has also been influenced by it; there have been social changes with the development of technology. Most people still view technology as a product that references objects that can make life more comfortable. We cannot yet utilize technology in such a way that social invention arises, even though the technology has already produced social change. Thus, technology cannot be held responsible if something negative occurs. Prevention of these negative consequences can be done with an isomorphic approach, namely, where two different complex structures are combined in such a way as to complement each other. And many more symptoms can be considered as to why transformation is needed.

Educational Trends

The development of society will influence the development of values, principles, and procedures in education. In the past, for example, the value considered good was "obeying" without questioning the reasons and goals; repetition (drills) were considered teaching procedures that are best applied to all kinds of teaching areas.

Various reform efforts have indeed been carried out, but now what is really needed is educational transformation, where the essence, institutions, and functions of education are developed with a new system of values, principles, and procedures as a whole. The following new trends can be used to consider the need for educational transformation efforts.

Learn to Investigate

This includes a person's ability to use intellectual processes and procedures to solve academic and practical problems. In natural science circles, this ability is called "learning to discover" (*discovery learning),* and in cultural science circles, it is called "creative learning" (*creativity learning).* This principle in its implementation is reflected in the teacher's reduction of explanations or lectures, and the increase in activities, research, both independently and in groups, by

students. Heather's (1970) believes that the most important function of education is to develop each person's ability to investigate so that they can solve their own life problems and effectively participate in group problems. This principle is suitable for use in a society where knowledge and its application are experiencing rapid changes (Miarso, 2005: 595).

Learn to be Independent

Namely, in the form of direction and self-control in acquiring and using knowledge. This ability is closely related to learning to investigate. This ability is essential, as success in life will be measured by the ability to act and think on your own and not depend on other people. There are at least two possibilities for implementing this principle: *First,* a learning program contains instructions for self-study by students with minimal teacher assistance, and *second,* involves students in planning and implementing their learning activities.

Study the Structure of Fields of Study

Material or information in the field of study continues to develop in line with the development of science itself (Fitri Mulyani, 2021). Because information continues to grow and human limitations, a more meaningful way is to study general ideas used as a basis for compiling, interpreting, and predicting phenomena in that field of study, or in other words, studying the structure of the field of study. This structure can be studied by understanding concepts, principles, procedures, and theoretical models. This method will be more economical and practical. A certain amount of basic information and facts must be mastered, but by learning this structure, the facts and data can be stored in various types of tools that can be retrieved at any time.

Learn to Achieve Mastery

This principle is based on the assumption that each student can master what he learns. The old assumption is that learning is successful by comparing with his group of friends (Parwati et al., 2023). Meanwhile, the new assumption compares it with mastery of the goals that were previously set. Mastery of this goal becomes the standard for all students, provided that each student receives assignments that are appropriate to their abilities and can be supplied with the materials, time, and guidance necessary for their success. With this principle, the teacher's primary role is to manage students' learning activities and provide the required advice.

Education for Personality Development

This development involves all aspects of personality as a whole, emphasizing cognitive aspects and the beliefs, interests, and values that shape a person's personality (Herwati, 2024). This principle can be supported in its implementation at school if children are trained early to direct their activities and be disciplined in carrying them out.

Systems Approach

In education, it is used in a problem-solving process oriented towards students' interests. This process is ongoing and constantly improved by new input.

(Nizami & Mahmudi, 2018)

Time Distribution

Education occurs constantly, especially during each person's waking hours, which are potential learning times. Thus, an education system should not be limited to school time only, but also to other times.

Distribution of Places

This principle is closely related to time distribution so that education can occur anywhere. However, if education is to be directed and supervised, institutional forms and procedures need to be arranged. This arrangement does not have to be formal but can develop as a societal habit.

Source Diversity

At the beginning of culture, humans obtained education from their natural surroundings. Until then, some people are given the authority to provide education, called "teachers". However, teachers are not the only source for students to obtain education. Teachers are only one human resource that must be equipped with non-human resources in the environment, such as tools, media, etc.

Role Differentiation

Due to the existence of various kinds of human resources, teachers must share roles with people who have instructional duties and functions. Thus, teachers no longer have sole authority in the instructional process.

Economics of Education

Education is a process that creates results; it cannot be free from economic considerations. Regarding component financing, funding for teachers is the most significant amount. Therefore, it must be used as efficiently and effectively as possible.

Development of Theory and Principles

Education is not a dead discipline, but continues to develop along with developments in human thinking, circumstances, and needs. As an applied science, education initially took many teachings from pure sciences. These teachings were then combined and developed further to systematize observations, provide explanations, make predictions, and create hypotheses about the phenomena studied (MIarso, 2005: 595-598).

Educational Technology Concepts and Possible Applications

Technology education is a relatively new concept, containing several ideas and references. The idea that wants to be realized is that every individual can develop to their maximum, maybe with the road utilising such technology, in line with the development of society and the environment. Meanwhile, the concept reference results from synthesizing observed symptoms and existing trends. The reference includes the following things as one unit.

1. People who have not received enough attention about their needs, conditions, and goals are studying.

2. There are students who do not get enough education from their sources, and therefore need to develop and use new sources.
3. The existence of new sources in the form of people, messages, materials, tools, specific ways of utilizing people, messages, materials, and tools, as well as the environment in which the learning process takes place.
4. Development of learning resources involves systematic activities that start from certain theoretical foundations and research results. These are then designed, selected, produced, presented, used, distributed, assessed, and refined..
5. Learning activities that utilize various sources, activities to produce or select learning resources, and people and institutions directly involved in these activities are managed to make activities more efficient, effective, and productive. (Miarso, 2005: 599)

The form of practical application of the concept of educational technology is as follows:

1. The availability and use of resources that enable people to learn.
2. Implementation of management and development functions in the process of procuring and using learning resources.
3. Increasing the level of learning decision making up to the level of curriculum preparation.
4. The emergence of various types of instructional patterns, which can be distinguished as follows:
   a. only the teacher interacts with the students.
   b. other learning resources that work through the teacher
   c. division of instructional roles between teachers and other learning resources
   d. other learning resources other than teachers used in learning
5. The emergence of various institutional alternatives for educational activities ranging from traditional schools to learning networks that contain formality criteria for implementation, authority, management, and diversity of learning resources.
6. There are quality standards for teaching materials and a wider choice of standard teaching materials.
7. Reduced diversity of teaching processes, but with better quality.
8. Learning planning and development is carried out by experts who are specifically responsible for it in teamwork.
9. The availability of teaching materials of better quality, as well as greater quantities and types.
10. He did assessment and improvement at all levels in the learning process.
11. Implementation of measurement of learning outcomes based on mastery of set objectives.
12. Developing understanding and role of teachers. (Miarso, 2005: 601)

Benefit Implementation Education Technology

Based on empirical analysis conducted by the United States Commission, the application of educational technology can produce the following:

1. Increasing educational productivity by:
   a. Accelerate the pace of learning stages
   b. Help teachers to use their time better.
   c. Reducing the burden on teachers in presenting information, so that teachers can foster and develop students' learning activities more.
2. Providing the possibility of a more individualized education by:
   a. reducing rigid and traditional teacher control.
   b. provide students with opportunities to develop according to their abilities.
3. Providing a more scientific basis for learning by:
   a. more systematic learning program planning.
   b. development of research-based teaching materials
4. Strengthen teaching, by way of: improving human capabilities with various communication media. presenting information and data more concretely.
5. Increase learning abilities by expanding the range of presentation.
6. It allows for more intimate learning because it can reduce the gap between lessons inside and outside school and provide first-hand experience.
7. Enabling equal distribution of quality education, especially by:
   a. shared use (to a greater extent) of energy or rare events.
   b. he brought education to those in need.

CONCLUSION

We all realize that science is growing continuously, and in numbers, the quality of information is growing exponentially. Someone can't control the increase in information by hoarding data or facts in their brain. Technology has developed rapidly, and it has also influenced our culture. There have been social changes with the development of technology.

Various reform efforts have been carried out, but educational transformation is now needed. Several new trends that can be used as a basis for considering the need for educational transformation efforts are as follows: probing learning, independent learning, learning the structure of fields of study, learning to achieve mastery, education for personality development, systems approach, distribution of time, distribution of places, diversity of sources, differentiation of roles, economics of education, development of theories and principles.

The application of educational technology, based on an empirical analysis carried out by the United States Commission, can produce the following things: increasing educational productivity, fostering and developing more students' learning activities, providing the possibility of more individualized education, providing a more scientific basis for learning, more solidifying teaching, increasing learning abilities by expanding the range of presentation, allowing for more intimate learning because it can reduce the gap between lessons inside and outside of school, and making it possible to distribute quality education evenly.

Based on the results of the literature analysis, this study has successfully achieved its objectives of exploring the concept of educational technology and identifying its strategic role in educational transformation. The findings affirm that

technology serves not only as a support tool, but also as a central driver in shaping a more relevant, effective, and future-oriented education system.

REFERENCES

Apriyanti, Y. O., Darmansyah, R., Kurnia, L. I., Zebua, R. S. Y., Ramli, A., Mamlu'ah, A. W., & Barokah, A. (2023). *ILMU MANAJEMEN PENDIDIKAN: Teori dan praktek mengelola Lembaga Pendidikan Era Industri 4.0 & Soceity 5.0*. PT. Sonpedia Publishing Indonesia.

Erwinsyah, A. (2016). Pengelolaan pembelajaran sebagai salah satu teknologi dalam pembelajaran. *Tadbir: Jurnal Manajemen Pendidikan Islam*, *4*(2), 80–94.

Firdhous, M. F. M., & Karuratane, P. M. (2018). A model for enhancing the role of information and communication technologies for improving the resilience of rural communities to disasters. *Procedia Engineering*, *212*, 707–714.

Firmadani, F. (2020). Media pembelajaran berbasis teknologi sebagai inovasi pembelajaran era revolusi industri 4.0. *KoPeN: Konferensi Pendidikan Nasional*, *2*(1), 93–97.

Fitri Mulyani, N. H. (2021). Analisis perkembangan ilmu pengetahuan dan teknologi (IPTEK) dalam pendidikan. *Jurnal Pendidikan Dan Konseling. Jurnal Pendidikan Dan Konseling (JPDK)*, *3*(1), 101–109.

Herwati, H. (2024). Pendidikan dalam perspektif islam dan peranannya dalam membina kepribadian islami. *BAHTSUNA: Jurnal Penelitian Pendidikan Islam*, *6*(1), 1–15.

Hidayat, T. (2024). Trendsetter Komunikasi Di Era Digital: Tantangan Dan Peluang Pendidikan Komunikasi Dan Penyiaran Islam. *Tabsyir: Jurnal Dakwah Dan Sosial Humaniora*, *5*(2), 1–6.

Irianto, H. A. (2017). *Pendidikan sebagai investasi dalam pembangunan suatu bangsa*. Kencana.

Koesnandar, A. (2013). Pengembangan model pendayagunaan teknologi informasi dan komunikasi (TIK) untuk pendidikan di daerah terpencil, tertinggal, dan terdepan. *Kwangsan: Jurnal Teknologi Pendidikan*, *1*(2), 122–142.

Kurniawan, S., & S Th I, M. S. I. (2017). *Pendidikan karakter di sekolah: Revitalisasi peran sekolah dalam menyiapkan generasi bangsa berkarakter*. Samudra Biru.

Lase, D., Waruwu, E., Zebua, H. P., & Ndraha, A. B. (2024). Peran inovasi dalam pembangunan ekonomi dan pendidikan menuju visi Indonesia Maju 2045. *Tuhenori: Jurnal Ilmiah Multidisiplin*, *2*(2), 114–129.

Mogas, J., Palau, R., Fuentes, M., & Cebrián, G. (2022). Smart schools on the way: How school principals from Catalonia approach the future of education within the fourth industrial revolution. *Learning Environments Research*, *25*(3), 875–893.

Mokalu, V. R., Panjaitan, J. K., Boiliu, N. I., & Rantung, D. A. (2022). Hubungan teori belajar dengan teknologi pendidikan. *Edukatif: Jurnal Ilmu Pendidikan*, *4*(1), 1475–1486.

Nizami, A. W., & Mahmudi, A. (2018). Problem-solving-based learning to improve students' learning interest. *AIP Conference Proceedings*, *2014*(1), 020046.

Parwati, N. N., Suryawan, I. P. P., & Apsari, R. A. (2023). *Belajar dan pembelajaran*. PT. RajaGrafindo Persada-Rajawali Pers.

Shareef, S. M., & Nithyanantham, V. (2022). *Fundamentals of educational technology*. Bentham Science Publishers.

Sianturi, N. M., Nofirman, N., Yulianti, E. B., Fatmawati, E., & Hendriarto, P. (2022). Relevancy technological innovation and community economic development in Indonesia. *Linguistics and Culture Review*, *6*(on), 117–130.

Sugiyono, P. D. (2019). Metode Penelitian Pendidikan (Kuantitatif, Kualitatif, Kombinasi, R&d dan Penelitian Pendidikan). *Metode Penelitian Pendidikan*, *67*.

Taruklimbong, E. S. W., & Sihotang, H. (2023). Peluang dan tantangan penggunaan AI (Artificial Intelligence) dalam pembelajaran kimia. *Jurnal Pendidikan Tambusai*, *7*(3), 26745–26757.

Wulandari, I. A. G., Aryana, I. M. P., & Kanta, I. G. E. S. (2022). Peran Teknologi dalam Pembelajaran Pendidikan Agama Hindu. *JAPAM (Jurnal Pendidikan Agama)*, *2*(02), 138–147.

Yaumi, M. (2016). Terminologi teknologi pembelajaran: suatu tinjauan historis. *Inspiratif Pendidikan*, *5*(1), 191–208.