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TECHNOLOGY MANAGEMENT IN EDUCATION AND TRAINING: A THEORETICAL CONCEPT

MANAJEMEN TEKNOLOGI DALAM PENDIDIKAN DAN PELATIHAN: SEBUAH KONSEP TEORI

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ABSTRACT

This study attempts to get a general understanding of technology management in training and education. This research employs a qualitative approach with the literature method. The findings indicated that management actions serve as the key support for educational technology to provide outcomes that are consistent with the goals. If there is a trained workforce in the area of educational technology who can 1) design learning processes and resources, with the scope of work including designing learning systems, message design, learning strategies, and learner characteristics, then educational technology can be developed and used properly; 2) create educational materials and methods, such as the advancement of print technology, audiovisual technology, computer-based technology, and integrated technology; 3) use learning procedures and tools, such as learning media, educational innovation dissemination, and rules and guidelines adoption governing education and training; 4) manage learning resources and processes with project management, and education-training management information systems, etc.; and 5) evaluate problem analysis, benchmark reference measurement, the formative and summative assessment included in the evaluation.

***Keywords**: Management; Educational Technology; Education; Learning; Training*

ABSTRAK

Penelitian ini bertujuan untuk mendapatkan gambaran tentang pengelolaan teknologi pada pendidikan dan pelatihan. Penelitian ini menggunakan pendekatan kualitatif dengan metode kepustakaan. Hasil penelitian menunjukan bahwa landasan utama dari teknologi pendidikan untuk mencapai hasil yang sesuai dengan tujuan adalah kegiatan pengelolaan. Teknologi pendidikan dapat dikembangkan dan dimanfaatkan dengan baik apabila tersedianya tenaga terlatih dalam bidang teknologi pendidikan yang mempunyai kemampuan dalam 1) merancang proses dan sumber belajar dimana lingkup pekerjaannya meliputi perancangan sistem pembelajaran, desain

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pesan, strategi pembelajaran dan karakteristik pembelajar 2) mengembangkan proses dan sumber belajar meliputi pengembangan teknologi cetak, teknologi audiovisual, teknologi berbasis komputer, dan teknologi terpadu, 3) memanfaatkan proses dan sumber belajar meliputi pemanfaatan media pembelajaran, difusi inovasi pendidikan, penerapan kebijakan dan regulasi pendidikan dan pelatihan 4) mengelola proses dan sumber belajar dengan lingkup pekerjaan meliputi pengelolaan proyek, pengelolaan sistem informasi manajemen pendidikan dan pelatihan, dan 5) Evaluasi meliputi analisis masalah, pengukuran acuan patokan, evaluasi formatif, dan evaluasi sumatif.

***Kata Kunci**: Manajemen; Teknologi Pendidikan; Pendidikan; Pembelajaran; Pelatihan*

INTRODUCTION

In the disruption era, innovation in education and training activities must be planned and carried out to advance the quality of education at this time (Horn & Staker, 2017; Huang, Liu, Tlili, Yang & Wang 2020). The innovation and planning are not only in the field of curriculum or facilities and infrastructure but also in other fields, such as the development of information technology in learning activities. According to Tanjung (2022), improving the quality of education is increasingly directed at expanding learning innovations in both formal and non-formal education to realize an efficient, fun, and intellectual process according to the age, maturity, and developmental level of students.

To provide convenience in every human activity, technology has a role in both positive and negative impacts (Park, & Zhang, 2022). One of the positive impacts is that it can deliver learning materials more easily, while one of the negative impacts is that it causes a person to be individualistic and less social.

Technology helps the learning process because the increasing need for knowledge cannot be fulfilled in education (Shafie, Majid, & Ismail, 2019; Ayu, 2020; Bernacki, Greene, & Crompton, 2020). Similarly, when exchanging data and information between work units and work units with the central government, especially in education and training, everything will be more effective and efficient if utilizing technology in the advancement of education (Nugraha, 2021).

Technology can also make the education and training process easier for trainers. The trainers become better and more reliable in delivering training materials and become more effective and efficient (Soegiharto, 2014). The trainers need to address this by continuously improving his competence, especially in utilizing technological information. The trainers should be able to encourage communication patterns in building interactive communication in learning that dares to use appropriate media and methods that can encourage activity and interaction among training participants (Arthur, 2018). This can be done by using Jamboard, Padlet, or other digital applications that allow participants to participate in collaboration and actively interact in the learning. This is in line with (Hanafiah, 2022), (Ediyanto, Atika, Kawai, & Prabowo, 2017), and (Nilasari,

2020) who states that an educator must also be able to keep up with the times and not be left behind by increasingly sophisticated technology both at this time and in the future.

The problem that arises from the conditions above is are the training participants ready to use digital technology by paying attention to contextual communication patterns in learning? As we know, in education and training, training participants come from various regions and institutions, where there are institutions whose facilities in mastering information technology are still not fulfilled. This is certainly an obstacle for them in participating in education and training activities that use technology in learning. Currently, improving the quality of trainee graduates is increasingly directed at expanding learning innovations to realize an efficient, fun, and intellectual process according to students' age, maturity, and developmental level (Arifudin, 2022) and (Fazriyansyah, Kusmayadi, 2023). The fields in educational technology are an integrated application of theory and practice covering the five domains or areas, namely design, development, utilization, management, and evaluation. These fields of activity are all aimed at solving human learning problems. As a profession, educational technology is formed from systematically planned (organized) efforts to implement the theory, intellectual techniques, and practical application of educational technology.

Educational technology is an applied scientific discipline, meaning that it develops because of needs in the field, in other words, learning needs (Bairizki, 2021) and (Kusbudiyah, 2019). The application of educational technology in learning is intended to make learning more effective, efficient, wider, faster, and more meaningful for training participants provided that the training participants can follow this application. So, this is the reason why researchers conduct research related to educational technology management and its role in training.

METHOD

This study aims to analyze and describe the concept of educational technology management and its role in education and training. Researchers used a qualitative approach with library research methods, namely by reading, studying and reviewing books and written sources related to research problems. Rahayu states that library research is a series of activities related to methods of collecting library data, reading and recording and processing research materials (Rahayu, 2020). This is supported by Arifudin who states that qualitative research is research in which data is expressed in verbal form and analyzed without using statistical techniques (Arifudin, 2021).

The object of this research consists of formal objects and material objects in the form of data related to a critical review of the study of the management of educational technology and its role in education and training. Data collection techniques were carried out using documentation techniques and literature studies, namely studying materials

related to the research object. Data collection techniques according to Bahri are the most strategic steps in research because the main objective of research is to obtain data (Bahri, 2021) and (Dahniar, 2020). Sources of data used include primary and secondary data. Primary data is data collected directly from the individuals investigated, while secondary data is data in the libraries (Hanafiah, 2021). Primary data sources were obtained directly from *widyaiswara* and training participants. So, in this research, researchers prepare research questions before working to obtain data so that it is valid and in accordance with the desired research objectives. The data collected is actual data and was found directly from the research location. The data collection tool in this study uses the documentation method because this research is library research. According to Ulfah, this technique is used to collect data from primary and secondary sources (Ulfah, 2022).

RESULTS AND DISCUSSION

The results will discuss the scope of educational technology management, the scope of educational technology, and the educational technology management and its role in education and training.

One of the cornerstones of educational technology is management activities. Management activities are closely related to processes and sources to produce planned outputs. Managing activities, which are often known as management, have various definitions according to the field of study and the application process. Management in a broad sense means the process of planning, organizing, directing, and supervising the efforts of organizational members and the use of other organizational resources to achieve predetermined organizational goals. This is in line with Fardiansyah who argues that management is a field of science that seeks systematically to understand how humans work together to achieve goals and create a more useful system of cooperation (Fardiansyah, 2022).

Based on these various definitions, management is a process of cooperation between a group of people in an organization to achieve certain goals by carrying out management functions. Good management will encourage the achievement of predetermined goals. Because in management there are functions that must be carried out. This management function will encourage activities to run well. Management has been a part of educational technology since 1920. According to Januszewski managing is necessary to control the products and processes used in the field (Januszeski & Michael, 2008). Seen from the point of view of the systems approach, managing is seen as a system of thinking more broadly about the management process in the development of learning and technology-based learning systems (Seels, 1994). In 1994 managing in educational technology was defined as the activities of planning, coordinating, organizing, and supervising resources, information, and delivery systems in the context of managing learning design.

Managing educational technology focuses on concepts and principles related

to managing appropriate technological processes and resources. Educational technology managers act as designers of learning activities, school media specialists, learning consultants, dealing with professional management issues, and so on (Barbara, 1994). Educational technology works with limited resources within a predetermined time to achieve set goals by managing the process and utilizing available resources. This is supported by Arsyad who states that the process is related to the planned learning design while learning resources can be a collection of teaching materials (Arsyad, 2009) and (Kinta, 2020). Management activities include designing the most relevant learning model and choosing the right tools and media, choosing people who are skilled in controlling each process of learning activities appropriately.

The concept of management is integral to the role of most learning technologists. Many learning technologists require a management function. For example, a technologist who serves as the media specialist for a school or college is responsible for the entire media center program. The programs undertaken by these technologists can be very different, but the basic skills required to manage the program remain the same. These skills include organizing the program, supervising personnel, planning, administering funds and facilities, and implementing change.

Technology is an extension of the human ability to be able to produce data or a product faster and more time so that it can facilitate human labor. In language, education comes from the word education which means development, teaching, and growing. Educational technology is a complex and integrated process, including people, procedures, ideas, equipment, and organizations to analyze problems concerning all aspects of human learning, as well as design, implement, assess, and manage the solution to these problems. According to Miarso (2004), the scope of educational technology includes 1) Design, which is the process of determining learning conditions to create strategies and products. There are at least four main scopes that include design from theory and practice, namely: learning system design, message design, learning strategies, and learner characteristics. 2) Development, which is the process of translating design specifications into physical form, which includes; print technology, audio-visual technology, computer-based technology, and integrated technology. 3) Utilization, which is the activity of using processes and resources for learning. The function of utilization is very important because it includes a link between the learner and the learning system. 4) Management, which includes the control of learning technology through planning, organizing, coordinating, and supervising. 5) Assessment, which is the process of determining whether or not learning technology is adequate which includes problem analysis, benchmark measurement, formative assessment, and summative assessment (Miarso, 2011).

In Indonesia, the application of learning technology is not much different

from the development in the United States, only a long time adrift. This development can be said to have only been recognized around the beginning of 1950, with the establishment of the Teacher Education Written Course Center (BKTPG) and the Educational Aids Center (BAPP) in Bandung. BKTPG, which is now the Written Teacher Training Development Center (*P3G Tertulis*), is responsible for organizing teacher qualification upgrading with written learning materials based on the concept of self-learning. If we listen to the description of these developments, we can conclude that the majority of education and learning personnel still exist in the smallest circle of learning media. They have not realized that the demands of the times are now in the circle of Performance Technology and Learning Technology. To find out the function of educational technology, it is necessary to return to the definition of educational technology. The function of the educational technology profession is a profession that finds a way out of learning problems either individually or in groups. The solution provided is in the form of design, development, utilization, management, assessment, and research on learning.

Based on the description above, the function of the educational technology profession facilitates human learning activities through certain approaches. Thus, the profession of educational technology can make people smarter in teaching and learning activities. In addition, educational technology is developed and utilized properly by experts in the field of technology. Educational technology as theory and practice has factually become an integral part of human resource development efforts, especially in the education and training system. With the availability of educated and trained personnel in the field of educational technology, it will conceptually ensure the application of educational technology in institutions that organize learning (Yuberti, 2015).

Education and training institutions that have competent personnel will easily apply educational technology to the maximum and obtain maximum results (Supriani, 2021). Thus, the quality of the graduates of education and training participants will increase.

Innovation (renewal), performance technology, and quality management can be powerful tools for organizational change. In the current development of the world of education, there are many developments taking place. One of them can be seen from the technology used which is increasingly varied and sophisticated. It cannot be denied that the technology used will also develop, so education will also be juxtaposed with technology that will help it achieve educational goals.

The use of technology is very useful in the world of education and training, therefore, to apply educational technology in a system, especially in education and training institutions, an educator is needed who has the ability in the following areas: 1) Designers of learning processes and resources; where the scope of work includes designing learning systems, message design,

learning strategies and learner characteristics, 2) Development of learning processes and resources; where the scope of work includes the development of print technology, audiovisual technology, computer-based technology, integrated technology, 3) Utilization of learning processes and resources; where the scope of work includes the utilization of learning media, diffusion of educational innovations, implementation, application of education and training policies and regulations, 4) Management of learning processes and resources; with the scope of work including project management, management of education and training management information systems, and 5) Evaluation; with the scope of work including conducting problem analysis, benchmark measurement, formative evaluation, and summative evaluation (Uno, 2011). Competent personnel are very influential in implementing educational technology optimally and obtaining maximum results. Thus, the quality of graduate's participants will increase. However, the problems that occur in the use of technology in digital learning and training are training participants' lack of understanding in operating the internet and electronic media, problems with internet networks, and inadequate facilities and infrastructure (Akhmadi, 2020). One of the efforts is to conduct training first related to the use of educational technology which will be applied either classically or online.

In improving the quality of human resources, development refers to the implementation of education and training. The training is designed to help trainees improve their ability to master technology. One form of training that is currently an alternative is digital education and training or e-learning. E-learning or digital training is a distance learning process that combines learning with information technology in its implementation.

In terms of digital competency, training participants are said to be perfect if they fulfill the management of the digital learning environment. Management of the digital learning environment is related to the readiness of the learning media owned by the institution or institutions as well as the readiness of the training participants themselves in using technology. Several things which are the most important part in forming training participants with digital intelligence are trained by forming positive habits which can be carried out by institutions or institutions (Trihantoyo, 2022).

Then, developing quality training management in the digital era is one of the keys to overcoming existing social inequality problems. This research shows to determine the importance of educational technology management in quality digital training in an era of increasingly rapid technology. To realize and resolve existing problems, especially in the demands of increasingly sophisticated developments, it is necessary to understand the function and objectives of human resource management as well as education and training to develop the quality of human

resources themselves in accordance with the demands and needs of the present and future.

The development of quality education and training management in this digital era must be implemented effectively and efficiently. So, in the education and training process, developing effective and efficient training management can be done digitally.

Technology and education are two elements that have an important role in developing and improving one's personality. The role of technology in developing the ability of trainees is significant enough to require trainers to be able to use technology well because with technology the delivery of material will be more varied and activities will be more interesting.

CONCLUSION

From the explanation of the results and discussion above, the main foundation of educational technology to achieve results by the objectives is management activities. This management activity is of course closely related to the processes and human resources in the training institution to produce the planned training participants. Educational technology in training can be developed and utilized properly if there are experts in the field of technology who have the ability to 1) design learning processes and resources where the scope of work includes designing learning systems, message design, learning strategies, and learner characteristics, 2) develop learning processes and resources including the development of print technology, audiovisual technology, computer-based technology and integrated technology, 3) utilize learning processes and resources such as the use of learning media, diffusion of educational innovations, implementation of education and training policies and regulations, 4) manage learning processes and resources with the scope of work including project management, management of education and training management information systems, and 5) evaluate problem analysis, benchmark measurement, formative evaluation, and summative evaluation. The use of technology in learning needs effective and efficient management.

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