

Hybrid Learning Innovation

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Submission date: 27-May-2023 12:52AM (UTC+0530)

Submission ID: 2102682529

File name: 7._Article_Text_Hybrid_Learning_Innovation_Hary_2023.pdf (369.27K)

Word count: 6040

Character count: 34961



HYBRID LEARNING INNOVATION: CHALLENGES FOR DEVELOPING TEACHERS SKILLS IN INDONESIA

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Abstract

The world of education receives a fairly high impact due to developments in technology and information. In the 21st century there has been a shift from industrial technology to information technology, so that in the future this causes teachers as educators and essential elements in the field of education to be able to learn new things in the teaching and learning process, including learning innovations. This research will be conducted to see how the challenges and readiness of teachers as educators face the influx of technological changes and innovations in implementing learning. The approach used in this study is a descriptive qualitative approach with descriptive analysis methods. This research uses secondary data that comes from the results of research and previous studies. In selecting data, the researcher selects various studies and studies that are still relevant to this research. This study found that the rapid development of technology and information requires educators to keep abreast of technological developments by continuously improving themselves, innovating learning, and adapting to the needs of society. In facing the various challenges that exist in the future, educators need to have various skills in life and career, learning and innovation skills, as well as skills in using media and technology.

Keywords: Teachers, Electronic Learning, Innovation, 21st Century.

Abstrak

Dunia pendidikan menerima dampak yang cukup tinggi akibat perkembangan teknologi dan informasi. Pada abad ke-21 ini telah terjadi pergeseran dari teknologi industri ke teknologi informasi, sehingga di masa mendatang hal ini menyebabkan guru sebagai pendidik dan unsur penting dalam bidang pendidikan mampu mempelajari hal-hal baru dalam proses belajar mengajar, termasuk pembelajaran. inovasi. Penelitian ini akan dilakukan untuk melihat bagaimana tantangan dan kesiapan guru sebagai pendidik menghadapi masuknya perubahan dan inovasi teknologi dalam pelaksanaan pembelajaran. Pendekatan yang digunakan dalam penelitian ini adalah pendekatan kualitatif deskriptif dengan metode analisis deskriptif. Penelitian ini menggunakan data sekunder yang berasal dari hasil penelitian dan penelitian sebelumnya. Dalam memilih data, peneliti memilih berbagai penelitian dan kajian yang masih relevan

dengan penelitian ini. Kajian ini menemukan bahwa pesatnya perkembangan teknologi dan informasi menuntut para pendidik untuk mengikuti perkembangan teknologi dengan terus menerus memperbaiki diri, berinovasi dalam pembelajaran, dan beradaptasi dengan kebutuhan masyarakat. Dalam menghadapi berbagai tantangan yang ada di masa depan, pendidik perlu memiliki berbagai keterampilan dalam hidup dan berkarier, keterampilan belajar dan berinovasi, serta keterampilan dalam menggunakan media dan teknologi.

Kata Kunci: Guru, Pembelajaran Elektronik, Inovasi, Abad 21.

INTRODUCTION

Currently, schools are in the era of knowledge, characterized by an extraordinary accelerated growth of knowledge. Education in the 21st century is becoming increasingly important to ensure that students can learn and create, take advantage of information technology and media, and work and develop using life skills.¹

The development of information and communication technology has changed the habits of working, socializing, playing and studying humans. Entering the 21st century, technological advances have penetrated all aspects of society, including education.² In the 21st century, teachers and students, lecturers and students, as well as educators and students must have teaching and learning skills. Students and teachers have to face several challenges and opportunities to survive in this knowledge age in this information age.³

Everyone recognizes the 21st century as the century of knowledge, which is the basis for many aspects of existence. The 21st century learning paradigm emphasizes students' abilities to think critically, apply knowledge to the real world, master information technology, communicate, and collaborate. Mastery of information technology which is often referred to as ICT Literacy is one of the skills needed to enter the 21st century.⁴

Eggen and Kauchak argue that 21st century or digital century school standards for teachers and students are related to the use of technology in education. Teachers must be able to prepare students for life in the digital age by using their understanding of subject matter, learning, and technology to facilitate advanced learning experiences, creativity, and innovation in in-person and virtual settings.⁵

¹ Powell, Justin J. W. "Comparative Education in an Age of Competition and Collaboration." *Comparative Education*, vol. 56, no. 1, 2020, pp. 57–78.

² Lee, Yi-Ching, et al. "Information and Communications Technology (ICT) Usage during COVID-19: Motivating Factors and Implications." *International Journal of Environmental Research and Public Health*, vol. 18, no. 7, 2021, p. 3571.

³ Liesa-Orús, Marta, et al. "The Technological Challenge Facing Higher Education Professors: Perceptions of ICT Tools for Developing 21st Century Skills." *Sustainability*, vol. 12, no. 13, 2020, p. 5339.

⁴ Kelliher, Clare, et al. "All of Work? All of Life? Reconceptualising Work-life Balance for the 21st Century." *Human Resource Management Journal*, vol. 29, no. 2, 2019, pp. 97–112.

⁵ Dharma, Wahyuni Rizka, et al. "The Utilization of ICT as Pedagogical and Professional Competencies to Support the Professionalism of Chemistry Teachers." *Indonesian Research Journal in Education IRJEI*, 2020, pp. 291–305.

Children in the ICT era will compete with students born and raised in the digital era; Therefore, teachers must have high technological literacy. As an institution that creates future educators/teachers, the Teaching and Science Institute (LPTK) must prepare teachers and prospective teachers with technological skills, especially ICT, because the problem of prospective teachers is related to ICT.⁶

This problem is in line with research from Suryaningsih and Nurlita who found that the development of the times causes students to become bored more quickly, so then there is a need for an innovation in the process of teaching and learning activities.⁷ Then in other studies, (Anggraeni and Sole) explains that the characteristics of digital learning are carried out through digital communication.⁸ E-learning learning is carried out with the aim of being able to improve the quality of the teaching and learning process.

The researcher then argues that with the development of the existing teaching and learning process, it is necessary to have an innovation that needs to be carried out by educators in improving this activity. Of course, the challenges in carrying out this learning innovation will be a challenge in itself that needs to be faced by educators.

Seeing the rapid development of science and technology, it cannot be denied that TTIs have a big role in producing educators who are technologically literate, especially in technology learning. Therefore, the teacher education curriculum should contain lecture material related to information technology, such as introduction to computers, development of ICT-based learning media, and electronic learning.

In practice, this research still has some limitations that can be improved by researchers in the future. Some of the shortcomings in this study that can be corrected in the future are that the discussion of this research is still only focused on innovations and changes that need to be made by the teacher as the teaching party. This research still does not look at the challenges that exist on the part of students as learning parties in this era of technological development. Then this research is still being carried out through the results of a literature review conducted on various previous studies. It is hoped that further research can go directly to the field to see the latest conditions that might provide the latest facts.

⁶ Gómez-Galán, José, et al. "Social Networks Consumption and Addiction in College Students during the COVID-19 Pandemic: Educational Approach to Responsible Use." *Sustainability*, vol. 12, no. 18, 2020, p. 7737.

⁷ Suryaningsih, Siti, and Riska Nurlita. "Pentingnya Lembar Kerja Peserta Didik Elektronik (E-LKPD) Inovatif Dalam Proses Pembelajaran Abad 21." *Jurnal Pendidikan Indonesia*, vol. 2, no. 07, 2021, pp. 1256–68.

⁸ Anggraeni, Desak Made, and Ferdinandus Bele Sole. "E-Learning Moodle, Media Pembelajaran Fisika Abad 21." *Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika*, vol. 1, no. 2, 2018, pp. 57–65.

The novelty that can be found in this research is that this research is no longer limited to explaining the various problems and challenges faced by teachers in carrying out teaching and learning activities in the era of electronic learning, but this research also seeks to be able to provide possible solutions to be able to help teachers in solving this problem.

LITERATURE REVIEW

A. Learning Innovation

As stated by Rogers, Innovation is an idea, practice, or object that is perceived as new by an individual or another unit. Innovation is an idea, action or object that is considered new by someone or other users. Rogers further stated that it does not matter whether an idea, practice, or object is objectively new or not. One's view of the novelty of an idea or object of practice determines one's reaction to the idea or object of practice.⁹ If one sees the idea as something new, that is innovation. The Ministry of National Education stated the same thing in the basic concept of the entrepreneurship module book: innovation is related to goods, services, or ideas that someone considers new. Although the concept has been around for a long time, those who have recently seen or experienced it can consider it a discovery.¹⁰

The formulation of innovation reads that innovation is a new idea, object or activity.¹¹ Rogers' direct quote on innovation: "an idea, a practice, an object that is perceived as new by an individual or other unit of adoption."¹² Peter Drucker and Hesselbein say that innovation is "a challenge that creates new dimensions of performance." Rogers' opinion is in line with the formulation on the site above. Drucker's formulation is based on his views as an expert in the field of human resources. This statement is slightly different from Rogers' previous formulation of innovation.¹³

In his explanation, for Drucker, innovation is a change, idea or idea that encourages a person as a user to work and work differently and better than before; or generate new performance

⁹ Chen, Yaru, et al. "Professionals' Responses to the Introduction of AI Innovations in Radiology and Their Implications for Future Adoption: A Qualitative Study." *BMC Health Services Research*, vol. 21, no. 1, 2021, pp. 1–9.

¹⁰ Lee, Kyungmee. "Openness and Innovation in Online Higher Education: A Historical Review of the Two Discourses." *Open Learning: The Journal of Open, Distance and e-Learning*, vol. 36, no. 2, 2021, pp. 112–32.

¹¹ Lee, Yi-Ching, et al. "Information and Communications Technology (ICT) Usage during COVID-19: Motivating Factors and Implications." *International Journal of Environmental Research and Public Health*, vol. 18, no. 7, 2021, p. 3571.

¹² Hernández, Ricardo J., et al. "Design, the Language of Innovation: A Review of the Design Studies Literature." *She Ji: The Journal of Design, Economics, and Innovation*, vol. 4, no. 3, 2018, pp. 249–74.

¹³ Caseiro, Nuno, and Arnaldo Coelho. "The Influence of Business Intelligence Capacity, Network Learning and Innovativeness on Startups Performance." *Journal of Innovation & Knowledge*, vol. 4, no. 3, 2019, pp. 139–45.

dimensions. Innovation occurs simultaneously with the emergence of challenges because every innovation causes humans to be in different situations and requires adjustments. There is innovation related to leadership. Usually, an assertive leader wants to change things for the better.¹⁴

Evidently, of the many definitions of innovation put forward by these experts, there is no fundamental difference in the definition of innovation. If only the sentence structure or emphasis is inconsistent, the meaning is basically the same.¹⁵ All of these definitions state that innovation is a man-made concept, practical object, method, process, or goodness that is noticed or perceived as something new by individuals or groups. Novelty may be the result of an innovation or invention that is used to achieve certain goals or solve certain difficulties.¹⁶

B. Electronic Learning (E-learning)

E-learning is a kind of information and communication technology that allows students to study whenever and wherever they choose. E-learning or electronic learning began in the 1970s. A number of terminologies, including online, internet-enabled, virtual, and web-based learning, are used to communicate perspectives and ideas about e-learning.¹⁷

E-learning is a type of education that is assisted and assisted by information and communication technology. E-learning is a kind of information technology that is used as a virtual environment in education.¹⁸ E-learning refers to the transformation of the traditional learning process in schools and universities into a technology-enabled digital form.¹⁹

Seok stated that “e-learning is a new form of pedagogy for learning in the 21st century. E-Teachers are e-learning designers, interaction facilitators, and subject matter experts. E-learning is

¹⁴ Gupta, Shaphali, et al. “New-Age Technologies-Driven Social Innovation: What, How, Where, and Why?” *Industrial Marketing Management*, vol. 89, 2020, pp. 499–516.

¹⁵ Lüdeke-Freund, Florian, et al. “The Sustainable Business Model Pattern Taxonomy—45 Patterns to Support Sustainability-Oriented Business Model Innovation.” *Sustainable Production and Consumption*, vol. 15, 2018, pp. 145–62.

¹⁶ Ellis, Viv, et al. “‘Come to a Screeching Halt’: Can Change in Teacher Education during the COVID-19 Pandemic Be Seen as Innovation?” *European Journal of Teacher Education*, vol. 43, no. 4, 2020, pp. 559–72.

¹⁷ Singh, Madanjit, et al. “Indian Government E-Learning Initiatives in Response to COVID-19 Crisis: A Case Study on Online Learning in Indian Higher Education System.” *Education and Information Technologies*, vol. 26, no. 6, 2021, pp. 7569–607.

¹⁸ Alsoud, Anas Ratib, and Ahmad Ali Harasis. “The Impact of COVID-19 Pandemic on Student’s e-Learning Experience in Jordan.” *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 16, no. 5, 2021, pp. 1404–14.

¹⁹ Ngoepe, Mpho, et al. “Inclusion of Digital Records in the Archives and Records Management Curricula in a Comprehensive Open Distance E-Learning Environment.” *Information Development*, 2022, p. 02666669221081812.

a new form of teaching and learning in the 21st century. E-teachers are instructional learning designers, interaction facilitators, and materials experts.²⁰

E-learning has the following attributes: 1) has content that is relevant to learning objectives; 2) use learning methods, such as presenting examples and exercises, to enhance learning; 3) using media elements such as words and pictures to convey learning material; 4) enable direct teacher-centered learning (synchronous e-learning) or designed for independent learning (asynchronous e-learning); and 5) build understanding and skills related to learning objectives individually or collaboratively.²¹

According to Rusman, e-learning has the following characteristics: (a) interactivity; (b) independence; (c) accessibility; and (d) enrichment. Among the qualities of e-learning are as follows: First, utilizing electronic technology services through which teachers and students, students and fellow students, or teachers and fellow teachers can communicate relatively quickly and are not limited by protocol problems.²² Second, use the benefits of computers (digital media and computer networks) to your advantage.²³ Use self-study resources stored on a computer so teachers and students can access them whenever and wherever they are needed.²⁴ Study schedules, curriculum, study progress results, and information related to education administration can be viewed on the computer at any time.²⁵

Purbo and Antonius needed three elements in e-learning design to provide engaging and engaging e-learning: simplicity, individualization, and speed. A simple system will make it easier for students to take advantage of existing technology and menus, and with the convenience of the panels provided it will reduce the introduction of the e-learning system itself, so that participants' study time can be focused on the learning process and not on learning using the e-learning system.²⁶ Personal criteria show that teachers can interact effectively with students, such as teachers who speak directly in class. With a more personalized approach and involvement,

²⁰ Mansur, Maulana, et al. "E-Learning in Physical Education Learning: How Are Students' Perceptions during the COVID-19 Pandemic?" *Journal Sport Area*, vol. 7, no. 2, 2022, pp. 171–84.

²¹ Rodrigues, Helena, et al. "Tracking E-Learning through Published Papers: A Systematic Review." *Computers & Education*, vol. 136, 2019, pp. 87–98.

²² Chirumamilla, Aparna, et al. "Cheating in E-Exams and Paper Exams: The Perceptions of Engineering Students and Teachers in Norway." *Assessment & Evaluation in Higher Education*, vol. 45, no. 7, 2020, pp. 940–57.

²³ Jimenez-Marquez, Jose Luis, et al. "Towards a Big Data Framework for Analyzing Social Media Content." *International Journal of Information Management*, vol. 44, 2019, pp. 1–12.

²⁴ Chai, Siyu, et al. "Analysis of Multiinterface Autonomous Moral Learning Platform Based on Intelligent Computing." *Mobile Information Systems*, vol. 2022, 2022.

²⁵ Leithwood, Kenneth, et al. "How School Leadership Influences Student Learning: A Test of 'The Four Paths Model.'" *Educational Administration Quarterly*, vol. 56, no. 4, 2020, pp. 570–99.

²⁶ Herawati, Andi Febri, et al. "Utilization of E-Learning as Media in Indonesian Language Courses in Higher Education Post COVID-19 Pandemic." *AL-ISHLAH: Jurnal Pendidikan*, vol. 13, no. 3, 2021, pp. 2757–66.

students' progress is monitored and all their concerns are addressed.²⁷ Students will feel comfortable in front of a computer screen for a long time. Then, this service is supported by speed, fast resolution of complaints, and other student needs. Thus, educators or managers can accelerate learning.²⁸

RESEARCH METHOD

This research will be conducted using a qualitative approach. The data analysis method used is descriptive analysis. This method is used to be able to provide an overview of the phenomenon being studied.²⁹ The data used in this study were obtained from previous studies which are still relevant to this research. Researchers will process the research data that was successfully obtained so that the results of this study can be determined in the future.

RESULT AND DISCUSSION

A. E-Learning as Innovation in Learning

As an innovation in learning, e-learning certainly has advantages over manual learning. If manual learning requires face-to-face meetings between teachers and students, it is different from electronic learning. Students can access learning materials anytime and anywhere.

E-learning is an invention that can be utilized in the learning process, not only for the distribution of learning materials but also for the development of various student competencies. Through e-learning, students actively watch, perform, and so on, apart from receiving content explanations from the teacher. Teaching materials can be virtualized in various ways to make them more interesting and dynamic, thereby encouraging students to continue the learning process.

The ability of internet technology and various software that continues to grow helps the manufacture of electronic learning materials. Periodically and quickly, learning materials can be completed or updated according to the demands of the evolution of scientific content. It is also possible to complete the process of presenting learning material both based on student input and the findings of the assessor teacher/lecturer/instructor as the person in charge of creating the learning material itself.

²⁷ Gelles, Laura A., et al. "Compassionate Flexibility and Self-Discipline: Student Adaptation to Emergency Remote Teaching in an Integrated Engineering Energy Course during COVID-19." *Education Sciences*, vol. 10, no. 11, 2020, p. 304.

²⁸ Ezra, Orit, et al. "Equity Factors during the COVID-19 Pandemic: Difficulties in Emergency Remote Teaching (Ert) through Online Learning." *Education and Information Technologies*, vol. 26, no. 6, 2021, pp. 7657-81.

²⁹ Ramdhan, Muhammad. *Metode Penelitian*. Cipta Media Nusantara, 2021.

Teachers/lecturers/instructors who will design electronic learning materials must first have the knowledge and skills needed for their development. Likewise with regard to the management of learning activities. Teachers/lecturers/instructors must be committed to monitoring the development of their students' learning activities and motivate them on a regular basis; this activity requires efforts to continuously control the quality of the process itself.

B. The Urgency of 21st Century Teacher Competency Improvement

Learning in the 21st century requires students to have skills, knowledge, and talents in technology, media, and information, as well as in learning and creativity, as well as in life and professional skills. The Ministry of Education and Culture formulated that the 21st century learning paradigm emphasizes students' ability to gather information from various sources, formulate problems, think analytically, and solve problems collaboratively. According to Frydenberg and Andone, critical thinking skills, knowledge and skills of digital literacy, information literacy, media literacy, and mastery of information and communication technology are needed for learning in the 21st century.

The challenge for the world of education in the era of the industrial revolution 4.0 is that an educator or teacher must be able to change the mindset of students from using to creating. Education must be able to produce graduates who have sufficient abilities to be able to adapt to the demands of changing times and be able to compete with foreign workers. All of this is done so that education can link and match with the needs of the community so that the graduates produced can be directly absorbed by the world of work. Meanwhile, the challenge of science and technology-related education in the digital age society is that education can empower students to develop and apply science and technology in various areas of life wisely.

The technology that needs to be developed and applied is appropriate technology, both in terms of technology that is environmentally friendly and friendly to the community. The challenge for teachers in the digital era is that current technological sophistication makes students no longer compatible with the 20th century education system. Many teachers still use 80s products, while students use contemporary products. As a result, teachers and students have radical differences due to many discrepancies between teachers and students. This is exacerbated by the condition of teachers who are very slow in pursuing the pace of education modernization. The teacher only conveys information that he knows from limited sources.

In the digital era, students can get information quickly from various multimedia sources. Teachers prefer to present knowledge sequentially, rationally, and logically. Meanwhile, students in the digital age want random access to hyperlinked multimedia knowledge. Teachers want their

students to work independently, while digital age students prefer simultaneous interactions with many people.

In addition, digital students seek education that is relevant, engaging, and immediately applicable, but teachers prefer to stick to the curriculum and meet standards. Digital age students are more familiar with screens and gadgets than paper and boards. Even so, there are still many teachers who do conventional learning using paper and blackboards. There are so many threats and challenges faced by educators, especially teachers. The role of the teacher in schools is disappearing, being replaced by increasingly sophisticated technology. Especially now that there are many learning service provider features that can be accessed anywhere and anytime. Social media, which is currently very popular with the public, especially students, also has great potential to shift the role of the teacher as an educator, one of whose duties is to disseminate information and knowledge.

How could it not be, through cyberspace, students can quickly mingle, consult, greet and greet cheerfully and build relationships with anyone through the available chat services. Problems, such as over-interaction and deviant behavior, may arise as a result of the rapid growth of information and communication technology and the large degree of technological freedom. In addition to bringing many benefits, the digital era also has negative impacts, crimes such as pornography, bullying, cybercrime, and many more are increasingly prevalent and threatening minors. If children are not equipped with character education, then children can become victims of crime. In carrying out their duties, a teacher is responsible for educating and building the character of his students. This is the toughest challenge for teachers in the era of the industrial revolution 4.0. For this reason, teachers must increase creativity by developing their competence. The teacher must be able to provide a logical explanation of the topic of knowledge being taught by continuously acquiring expertise and upgrading it according to the latest developments.

In addition, teachers must be able to draw connections between real-world situations and the material being taught. Teachers must be responsive and prevent their students from getting bored by providing information in only one direction. According to Sudiarta, teachers must be able to increase their creativity about how students construct knowledge, such as how to create a learning environment that allows students to actively and independently learn from various learning sources, thereby enabling students to develop their overall competence.

C. Teacher Challenges in the 21st Century

As a teacher who will practice in the 21st century, you must have skills that are relevant to the demands of this century. Learning produced in the 21st century is learning that can develop holistic competencies, equip students with various core courses according to their areas of

expertise and equip them with interpersonal and intrapersonal competencies that are more non-academic in nature.

The challenge for teachers in the 21st century is how to teach some of the skills demanded by that century. The 21st century skills are (1) life and career skills, (2) learning and innovation skills, and (3) information media and technology skills. These three skills are summarized in a scheme called the 21st century knowledge-skills rainbow. These three skills will be explained in more detail as follows.

a) Life and Career Skills

Life and Career Skills include (a) Flexibility and Adaptability; (b) Initiative and Self-Direction; (c) Social and Cross-Cultural Interaction; (d) Productivity and Accountability; and (e) Leadership and Responsibility.

b) Learning Skills and Innovation

Learning and innovation skills include (a) Critical Thinking and Problem Solving; (b) Communication and Collaboration; (c) Creativity and Innovation. These four skills, known as the 4Cs, have also been recommended by the National Education Association (NEA) for completing the core subjects of an educational program.

In preparing generations to become citizens of a global, information and knowledge society, NEA recommends the importance of developing the "Four Cs". The four C's in question are; (1) Critical thinking and problem solving, which includes the ability to argue effectively, think systematically, make justifications and decisions, and solve problems; (2) Communication, able to convey thoughts and ideas effectively in oral, written and other nonverbal forms, skilled listening (listening skills), able to use communication tools effectively and functionally, able to communicate with various groups, various purposes, and various cultural contexts; (3) Collaboration, the ability to work effectively in teams, be flexible and willing to compromise to achieve common goals, and be able to share responsibility and appreciate the contributions of team members; (4) Creativity and Innovation, is the ability to think creatively, work creatively with others, able to implement creative ideas in practice.

The four skills in practice must be integrated into holistic learning so that students can master them. Critical thinking and problem solving can be trained by providing constructive input. Ama and Sartati found that student learning outcomes in solving math problems increased by using the snowball throwing model. In line with these results, Bili and Ate using a problem-based learning model stated that student problem solving learning outcomes could increase. Communication skills can be trained by creating a language-rich environment, such as cooperative learning. Sumiyati and Khotimah's cooperative learning research stated that

cooperative learning has characteristics that can develop student learning outcomes, including communication skills through activities that involve thinking processes, teamwork, and tolerance among students. Collaboration skills can be developed by providing opportunities for teamwork and cultivating high respect and tolerance for others. Meanwhile, creativity and innovation skills can be developed by providing autonomy in making choices and opportunities to create and innovate.

c) Media and Information Technology Skills

Media and information technology skills include (a) information literacy, (b) media literacy, and (c) ICT/Information and Communication Technology literacy. One of the skills in information technology and media that needs to be prepared in equipping prospective teachers is ICT literacy. This is of course a provision for teachers to be literate in technology and develop technology-based learning such as learning videos, multimedia learning, and electronic learning (e-learning) using a network and without a network. These skills are very important for TTIs, so they include e-learning courses as elective courses in the curriculum of the PGSD study program. Anggaraeni and Sole's statement strengthens the statement which states that literacy in education includes information literacy, media literacy, information literacy, Communication and Technology or ICT.

CONCLUSION

Along with the pace of change and development that has taken place in the global era, which is far different from twenty or thirty years ago, the demands for human competency to be able to live, work, and seize opportunities to participate in it are far more complex. The development of science and technology requires educators to be more literate in technology, information, and communication. Higher education institutions as educator-producing institutions (LPTK) must of course keep up with the pace of development of science and technology by continuously improving themselves, innovating learning, and adapting to the needs of the user community. In facing these challenges, it is necessary to have various skills possessed by the teacher to be able to answer these challenges. These skills include life and career skills, learning and innovation skills, and skills in using media and technology.

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