What Experts Say About Teachers' Understanding Of Technological Innovation In Their Work

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Abstract : This qualitative study measured experts' understanding and expressions about teachers' understanding of technological innovations in Indonesia's teaching assignments. Success in carrying out teaching assignments for school students closely related to technological innovation skills in management in today's digital time. To facilitate the discussion of study topics, we have collected secondary data from many scientific reports and studies, including scientific reports, literature reviews, and direct observations to several schools about how teachers have innovated technology in helping their teaching assignments in the global era. After the data, we then analyzed it with the in-depth interpretation, which consisted of the coding process, before concluding. In concluding, we pay attention to the validity and reliability aspects of the data findings so that our answers have answered this educational study's questions. Our data search process used data search engines such as Google Search and Google scholar with the help of keywords, "Understanding Teacher," Technology Innovation, "TeacherTeacher Working, "What experts Say on teachers Understanding on technology, "etc. Finally, we can report that teachers' understanding in Indonesia still considers that technology such as smartphones, laptops, and the like are still limited as consumptive users, not yet productive like the capacity of technology for teachers and other professionals' duties jobs. Therefore, this finding is a good insight for teacher teachers, researchers, and policy-making in education and training.

Keywords: Teacher Understanding, Innovation Technology, Teacher Work, and Student Learning Outcomes.

INTRODUCTION

Information technology is a tool that can be used in information and communication quickly and efficiently, for example, smartphones, laptops, tablets, Ipad, and computer desks. Lei & Morrow, 2010). These are all information technology (IT) that can be used in completing the work of all other businesses, including the work of the teaching profession in carrying out tasks by handling information and communication very quickly and efficiently. Is it possible for teachers to use all that technology has to help with teaching assignments? Researchers want to get a more accurate understanding of various experts and education, especially what they say about technological innovation in Indonesia's classroom activities in digital days.

In education, the delivery of information using technology is essential to the education process. The learning and measurement process can do IT, for example, using computers, laptops, and cellphones. Through this media, the learning process becomes more exciting and costs more efficient in using paper. IT can be applied in education in the learning and evaluation process. The teacher learning process can use virtual classes using the Android mobile application. By using virtual classes, the teacher does not have to enter the classroom in learning. The teacher-teacher only provides an access code to enter the virtual classroom. Meanwhile, in terms of costs, teachers can use the android application, thus guaranteeing that the paper and the final result can be immediately known using various options.

In the world of education, technology also plays a prime position in education and training. Moreover, currently, the ICT-based Curriculum 2013 is being implemented, which means that every subject will be integrated with technology. IT is beneficial in delivering learning materials is that the material we deliver is more interactive and creative. Students will also be happier in our subjects. Teacher education is expected to be able to master IT. Teachers need to master in the Digital Age. Teachers who have not mastered IT. Should often attend training in that field of training, little by little, the teacher will master IT why teachers are required to master IT because all forms of information through technology are computer-based UKG TEST. Filling in employee data also uses IT applications, such as SIKEPO, MPEG, Dapodik. For this reason, teachers are required to master IT.

Students must master technology because the digital era's production process uses IT, such as school exams, final semester exams, IT-based national exams, or computerization. If it does not master, the production results will be hampered. Today many students use cellphones. However, cellphones are used only for playing games. If students appropriately use the cellphone, it will provide benefits in the educational process. Teachers and students in the digital era in the world of IT literate education should develop themselves in the educational process in human learning.

The Important of Research

Efforts to increase understanding of a particular theme can be pursued in various ways. One is a literature review, which generally contains descriptions of concepts, theories, findings, and other information data obtained from reference materials to be used as a basis for research and training activities. The descriptions in this literature review can be used to formulate a framework for understanding teachers' duties regarding their understanding of technological innovations in teaching previously described. Strengthening understanding of the field of study of technological innovation for teachers usually begins searching for literature related to education and teaching subjects. A literature search is a step to collect information on how teachers usually interact with technology, how their thoughts and views are relevant for increasing understanding that requires data from previous expert studies. Because literature review, previous studies are an essential part of a study that explores new understandings in education and teaching involving technological innovation. A literature review is also called a literature review due to descriptions or descriptions of data relevant to a particular field or topic. This method provides an overview of what many experts or researchers have discussed. The following is the table of students' information on technology ability in Indonesia. Figure I.
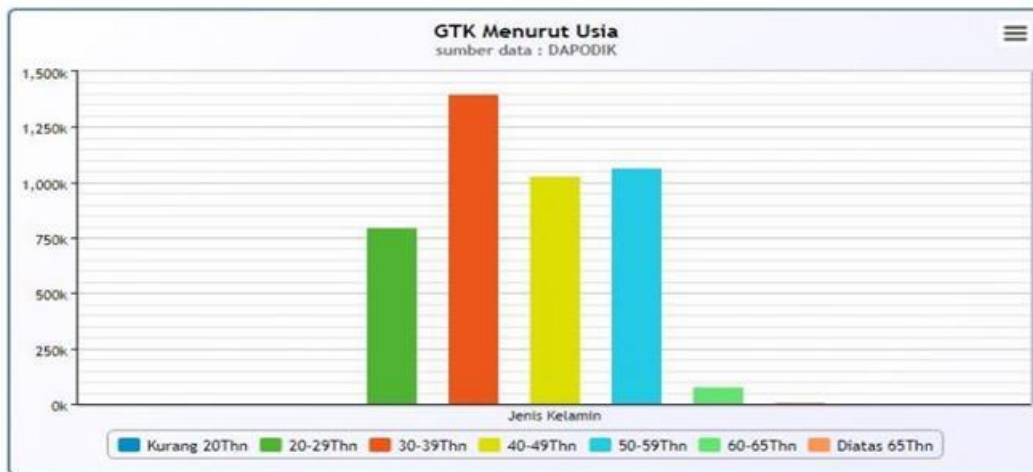
Source: Dapodik

The results of the 2018 survey, Gatot Suhartowo as head of the Center for ITC (Pustekkom) of the Ministry of Education and Culture, which coincided with chairing the national coordination meeting (Rakornas) of ICT at the Novotel Banjarbaru Hotel, said that today the more educator in Indonesia, only 50 percent are good in those ITC. Strengthened through the Ministry of Education and Culture's website, the number of teachers, according to Indonesia's age as of October 30, 2020, reached 4 million educators. With this data that is linked to the previous statement, it can be said that there are around 2,400,000 teachers who are still tech-savvy. The number is quite alarming, where teachers who are supposed to be at the forefront of Indonesian education are still minimal about using the latest technology.
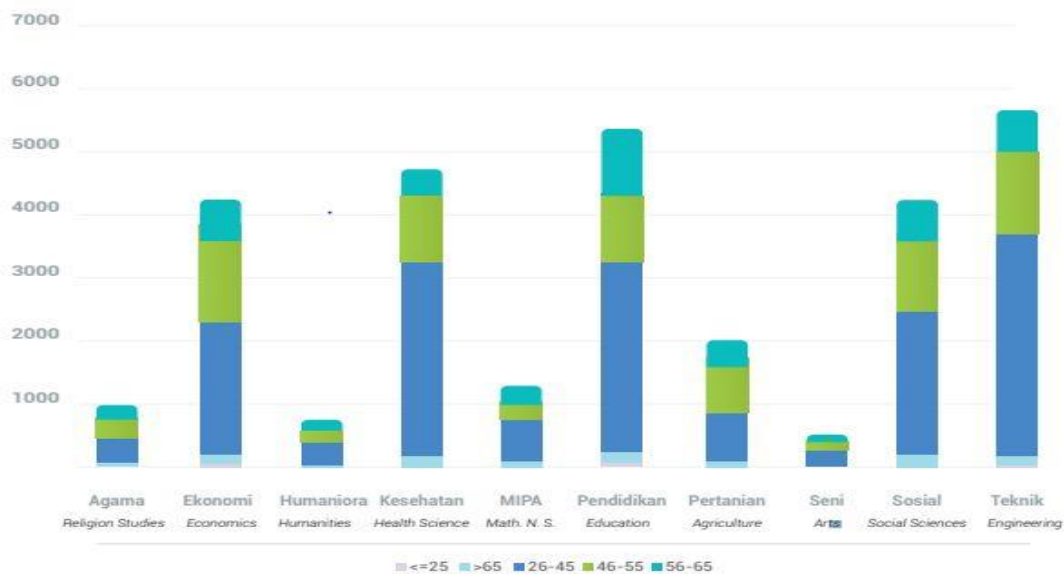
Source: Minister of National Education

Other data related to the distribution of lecturers in Indonesia, which can also be seen in the diagram above, there are young lecturers aged <= 25 years who are spread mostly in Engineering (395 lecturers) and Education (345 lecturers) study programs. Meanwhile, lecturers> 65 years of age mostly teach in the Health Sciences study program (1,236 lecturers). It does not rule out the possibility that elderly lecturers need extra energy to learn new technologies used in today's online learning period. This world grief in 2020 has a tremendous impact on the entire order of life. The world of education has not escaped the impact of the Covid 19 pandemic. Everyday learning that should have been face-to-face at school between teacher and student is now virtual. Using an online learning model (online) is the best solution for Indonesian education. The teacher's various conditions make the difficulty seen here and there. When students are required to understand the learning technology used, some teachers study hard to be quickly conveyed during virtual learning. Apart from studying the media, teachers, lecturers, and people involved in the world of education must convey learning material well and pleasantly. It is enough to make the sigh heavier.

The development of the education era 5.0 demands that all elements within the education circle run to learn quickly about technological developments. Concerning technology, it is also related to existing industries. The existing technology competition is also not only between students in one school or students on one campus. Even more complex than thought is the technology competition between countries in the world. Increasing the teaching staff's capacity can be done in several ways, some of which are always updating their knowledge, including teacher certification, being an active, creative educator, and having an approach to the surrounding environment. Referring to the problems that occur in the world of Indonesian Education, HAFECS comes with all easy solutions for "teacher training," lecturers, and education practitioners with the digital platform guru inovatif. Id. The guru inovatif. Id platform presented by HAFECS provides fresh air to teachers, lecturers, and practitioners who want to improve their educational abilities. The features contained in the guru inovatif. Id platform also answers the challenges of learning during the Covid 19 pandemic and becomes a "Teacher Learning Place" in any region. The easy-to-understand display of guruinovatif. Id helps teachers, lecturers, and education practitioners who want to visit the platform—being greeted with banners and information related to the greatness of the guruinovatif. Id platform makes visitors even more curious to surf on it. The menu displayed on this platform also has a sense of renewable education for anyone who sees it.

METHOD

In the following, we describe collecting and analyzing data to answer the questions of this study. This study's purpose is researchers' efforts to understand what experts say about teachers' understanding of technological innovation in learning in the digital era. Is there more value than various technologies for the benefit of education? In other words, has educational innovation become something productive for learning purposes, or is it still a consumptive material from technological sophistication. Data collection starts from all data sources and, in particular, the findings of studies by educators and innovation experts for teacher teaching opportunities. After collecting the data, we continued with the analysis through the coding process and in-depth analysis and concluding by considering the principles of validity and reliability of the findings in answering this study's questions. In getting qualitative data, we adhere to the expert theory of Siemens & Baker (2012, April), who says learning analytics in educational data mining. Studies towards educational communication and teaching collaboration. Our data search process took internet searching with the help of Google Searching and Google Scholar through searching for keywords such as teaching using technology innovation ", teachers job in school 21-century education," and "teachers chatting work in educating people in modern time."

RESULT AND DISCUSSION
RESULT

Mouza (2011) successfully explored teachers' perspectives regarding the role of technology, functions, and pedagogy that can be developed. He reviewed the potential for teacher work development centered on increasing cases to help teachers in advanced locations. He first adopted technology with its function and engagement pedagogy. Then he acquires the reflection needed to teach from experience. The study results revealed that the case study encouraged teachers to increase their thinking about the significant correlation between technological innovation, content analysis, pedagogical engagement, and teacher involvement in reflecting so that learning could be adopted. However, there are many variations in how teachers impart impressive knowledge, such as factors that can change teachers' views, including beliefs about technological innovations helping students, developing curricula, and dealing with achievement in times of human and financial shortages.

Van et al. (2019) examine the flow of educator development at universities during advanced technological innovation teaching. This study has succeeded in initiating lesson plans, especially those that focus on educational technology at universities, providing complete study rooms for teachers in universities. The results of their data coverage of 11 teaching staff were analyzed using a qualitative design to understand the

understanding and insights of various individual teaching lines and have identified a correlation between the flow of assessment, technological motivation, and perceptions of teaching through technological innovation into university teaching. They found three different teaching streams related to teacher choices and learning activities with continuing teaching activities; experimenting began with a learning approach and reflect on teaching experience.

Kopcha et al. (2016) succeeded in examining the understanding of several universities, especially their teachers, about efforts to innovate technology in their teaching and the extent to which they are tied to technology. According to this study, it is to understand lecturers' thoughts regarding technological innovation in their assignments and the influence of technology on the university where they serve intensively, motivated by creativity. The faculty, which consists of three profiles, shares the characteristics of assessing technology's role in teaching, albeit in different and nuanced ways. At the same time, this study's implication is teachers' caution not to think that university lecturers have the same meaning for phrases such as "innovating technology in learning. Furthermore, this study succeeded in interpreting technological innovation theories into the realm of education based on lecturers' assumptions, and Their faculty adapts themselves to the technology. Teaching innovations have shifted lately very rapidly, and their use continues to increase.

Serdyukov (2017) examines several innovations in education. He saw that some were failing, asking why they failed? To provide an analytical review of the teaching innovation section of the US. His study reviews several innovations that examine barriers to innovation and look for solutions to increase innovation in transformation in the teaching system. He understands that teaching in the US requires large-scale innovation to drive the desired quality education outcomes across sectors. An essential focus of teaching innovation should be on theoretical and practical education and learners, parents, the external community, and the culture. In the end, he was able to duplicate technological innovations based on theoretical foundations and aims, systemic and measurable pedagogy. The most important areas of technological study and innovation are efficiency and time. Here educational innovation is understood as a measurable system.

Mishra & Koehler's (2006) study of pedagogical technology's content becomes a knowledge framework for teachers. Those examining educational technology are criticized for their lack of theoretical exposure. So they have an idea of a framework for teaching technology and education how to build a foundation of Shulman, namely pedagogical content knowledge, and develop it into the trend of teachers adopting technology into the science of education. This framework is a 5-year work focused on improving teacher professionalism and upgrading university majors. In doing this, we play a full role and collaborate on the educational environment's three essential components: context, academic knowledge, and technological innovation. Finally, they argue that this system has many varieties to share in the discussion of technology adoption at various levels: theory, education, and methods. This study explains the theory and concepts behind the framework, provides a sample educational approach based on the framework and illustrates the method contributions found in their study.

Liu et al. (2014) examined technological innovations for the preparation of multicultural 21st-century teachers. Seeing that students are increasingly diverse and technological changes are increasingly fast, teachers need to be equipped with technological innovations to prepare US teacher teachers to increase their knowledge, skills to support a globalizing 21st-century world. Their study discusses the constant comparative method of analysis to empirical about multicultural teacher practice using technology to prepare teachers for diverse students in the twenty-first century. Previously, he synthesized the results of multicultural teacher research. The results collectively illustrate the advantages of technological innovation in the teacher's test of being a multicultural educator equipped with a global conception of diverse information and educational approaches to responding to twenty-first-century education. While the objectives of the use of technology in teacher preparation vary, and it is found that applied technology models can contribute to education and training throughout the international system. This analysis reveals the diverse study contexts, from teacher test learning rooms, field placement regulations, to departmental development training, both in the US and overseas.

Kereluik et al. (2013) critically look at the study of 21st-century science frameworks, with specifics on the meaning all for the teachers and the teachers' production kitchen. Their study identifies topics and domains of science in many articles describing the types of knowledge integral and essential for a country to succeed in today's world. They argue that if the blog is read. There are three kinds of knowledge needed in this century: basic imu, metaphysics, and religious humanistic. Although this century's response framework supports many types of knowledge, very little has changed now regarding total teaching objectives. Sustainability is a significant change in how technology has implications for all essential knowledge and knowledge delivered.

Ertmer & Ottenbreit-Leftwich (2010) examined teacher technology innovation: what knowledge, truth, belief, and culture intersect. Even though computer access and technology innovation training is increasing, technological advances are not being applied, pushing the regulation stronger. Their paper examines technology adoption through the vehicle for teachers to become knowledge agents: What is needed now is an expensive quality that allows teachers to turn technology into a powerful pedagogical tool? For this question, they reviewed the literature that deals with four variations of teachers' changing world: skills, self-understanding,

belief pedagogy, and learning culture. In particular, they develop that teachers' mindset must be improved to understand that work is ineffective if there is no fair use of the empowerment of technology and information power to encourage learning in the learning community.

Chou et al. (2019) innovative knowledge of teacher acceptance perceptions with technological innovation, a climate of innovation, and innovative educational applications of technology, information, and communication in Taiwan is so imp[ortant. This study found that innovation in organizations was positively and significantly related to innovative education using technology. This Kjain also received significant technological innovations, positively, regardless of the innovative education of technological innovation applications supported by a culture of innovation in every organization. The effect is empirical data on increasing innovation in technology and innovation culture in every organization on innovative education with technology that reveals a close fit in implicating the study results after being discussed.

Li (2007) examines what teachers and students view technology innovation in a two-word story in a technology research journal in teaching to critically examine how students and teachers perceive technology integration and innovation in education with the scope of the following questions: What are the teachers' perceptions about technology integrity in education? How do students view the application of technology in teaching and learning? Finally, how do students say about the trend of technology "overused, underused in education?" A total of 15 science and mathematics teachers and 450 secondary students were involved. The results show that teachers 'views on the application of technology in education tend to be wrong, while students' views can be summarized as enthusiasm and enthusiasm. Most surprising of all, the fear of being replaced by technology contributes to the trend of being overused and underused.

DISCUSSION

It was explained that the main objective of this study was to analyze the knowledge and thinking, and expressions of experts regarding teachers' understanding of the application of technology and innovation in working in Indonesia. The answer is that ten international publications have provided evidence through their study findings that we can generally say support our study, which asks how teachers view technological innovation in teaching in this modern era. For example, Mouza (2011) has succeeded in exploring teachers' views and insights on the role of technology, functions, and pedagogy that can be developed. He reviewed the massive potential for teacher work in development centered on increasing cases to assist teachers in advanced locations. The research results revealed that the study encourages teachers to develop their thinking about the very significant correlation between technological innovation, content analysis, and pedagogical and teacher involvement in reflection so that education can be adopted. However, there are many options for how teachers can convey exciting views, such as aspects that can reform teachers' views, including beliefs about technological innovations that help students, innovating curricula, and dealing with the achievement of learning outcomes in times of human and financial shortages.

McGrail, E. (2005) said that technology-capable teachers are a significant component of education. Various other skills, such as communication skills, curriculum design, resources, and others, will not mean anything if there are no teachers who can apply and innovate technology. Because of the importance of a teacher with technology capability, it has been agreed that teachers are professionals who need various skills to ensure that their profession can be carried out correctly. The requirements of this profession continue to develop following the demands of the times. In the digital era, like what is happening today, professional teachers are again questioned about their requirements. In addition to the requirements that have been previously owned, it needs to be added with other suitable requirements. By referring to a sufficient number of authoritative literature and presented descriptively and analytically, this paper further focuses on the professional teacher requirements needed in the digital era.

The teachers' understanding and views are critical in assessing the map and its ability to be understood and improved. Some teachers need to be improved, and some are already good through ten studies on international studies on teacher skills and views on technological innovation. It is essential because it will be difficult for decision-makers to determine the competencies to be achieved without accurate data and information. For example, as reviewed by Kopcha et al. (2016), who successfully tested the understanding of several lecturers in higher education, especially their teachers, technological innovation breakthroughs in their curriculum, and the extent to which teachers tied their teaching to technology. This study is critical to hear teachers' voices, the lecturers' thoughts on ideas and technological innovations in their daily work, and the extent to which technological innovation affects the university where they serve intensively, motivated by creativity and innovation.

The implication for studying technological innovation in teaching is to encourage the acceleration process and improve performance and create, use, and regulate technological processes and capabilities. The minds of technologists must be absorbed and voiced, and their prominent role in educational technology. Because of their bright minds, they can encourage efforts to increase innovation totally in teaching and learning. New findings in educational technology innovation should be part of a general educational process. The teaching and learning process, in particular, is more efficient, more effective, and provides added value.

Effective and efficient means that educational efforts must achieve the goals outlined with low cost, skilled labor, and fast time.

We can summarize the results of this study with several recommendations that understanding teachers' views on the application and innovation of technology in their teaching require all forms of benefits and challenges. So with this, the researcher tries to provide some suggestions or recommendations as follows:

• To all teachers, increasing understanding and proficiency in technology use is very urgent, especially if teachers prepare future generations of teacher candidates with specific opportunities such as participating in training and upgrading report cards. It is intended to increase capacity in the field of technology so that it can innovate in learning.

• Researchers should continue to explore and study the application of technology in education so that new findings can provide new input for all stakeholders and actively contribute to advancing technological innovation in education, especially at the higher education level.

CONCLUSION

As explained earlier, the research objective was to understand teachers' views in terms of technological innovation in education. So by considering the right data from reading and reviewing the previous findings, we can summarize the results, among others. The publications we studied all emphasized the importance of understanding teachers' perspectives and views on technological innovation in education. It cannot be denied that the average teacher's view of technology is still in the stage of using technology as a daily means. Meaning that it has not been used as a means of work and study as expected by technology to be useful for various work and educational needs. Therefore, this finding is an initial input to encourage technological innovation in accelerating students' learning and education in the learning era with technological innovation with all its challenges and conveniences.

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