Jurnal Iqra' Kajian Ilmu Pendidikan

E-ISSN: 2548-7892 & P-ISSN: 2527-4449

Volume 8, Number 1, June 2023

Analyzing of Using Educational Technology to Improve the Quality and Equity of Learning Outcomes at Politeknik Maritim Negeri

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ARTICLE INFO
Article history:
Received
December 28, 2022
Revised
April 25, 2023
Accepted
May 22, 2023

ABSTRACT

This study aimed to identify the use of educational technology in supporting the education of the next generation who want to improve the quality and equity of learning outcomes. The researcher carried out a series of data collection at one of the tertiary institutions, namely the Indonesian state maritime polytechnic. The researcher obtained the needed data through the location observation interview approach and documentation. Next, it analyze uding a phenomenological approach. The secondary and primary data coding was checked, organized, organized, and finally interpreted to get relevant and valid conclusions to answer this study's problems. After a series of analyses and discussion of data, this study concludes that there were several use for technology to support activities and accelerate learning at the Indonesian State Maritime Polytechnic, including that technology has become a core in learning because the power of innovation and revolution provides equity learning result in student learning. These various features and technology platforms enabled very effective and innovative learning, such as in efforts to develop the quality of lecturers with a variety of choices for learning or artificial intelligence to enable learning to occur more autonomously and accelerate training models and other classroom exercises. The study's results provide additional information for similar studies in the future.

Keywords: *Equity Learning Outcome, Quality Learning Outcome, Educational Technology*

How to cite: Rahayu, S (2023). Analyzing of Using Educational Technology to Improve the Quality and Equity of Learning Outcomes at Politeknik Maritim Negeri. *Jurnal Iqra' : Kajian Ilmu Pendidikan, 8*(1). 100-117
https://doi.org/10.25217/ji.v8i1.3238

Journal Homepage: http://journal.iaimnumetrolampung.ac.id/index.php/ji/

INTRODUCTION

The fourth industrial revolution is referred to as number 4 in industry 4.0. The growth of technology studies in education is experiencing rapid development (Kayembe & Nel, 2019; Putra & Aslan, 2020; Putra et al., 2020). It declared its first revolution in 1784 when mechanization and steam engines replaced human power. At the end of the 19th century, there was a second revolution in which electric production machines were used for mass production. The third revolution started in 1970 with the introduction of computer technology to manufacturing automation. The idea to integrate sensor technology, data analysis, and interconnection into various industrial fields arose from the rapid development of these technologies (Colombo et al., 2021). It

is estimated that this concept will lead to the fourth revolution. It exemplifies the trend of manufacturing technology toward automation and data exchange. As a result of human, machine, and data connectivity, this industry is now starting to influence cyberspace. Everything is everywhere. The Internet of Things (IoT) is the name given to this concept. The concept of work, job structure, and competencies required in the workplace changed during the industrial revolution 4.0 (Ivaldi et al., 2021). Based on excellence and the advancement of the role of technology in scientific and educational tasks, the identification of the use of technology in the education of the next generation is an effort to increase and equalize study opportunities at vocational and general tertiary institutions, such as at the Indonesian State Maritime Polytechnic.

Traditional teaching methods still hold sway in many schools and universities due to the need for the widespread adoption of technology. Frontal dominates the teacher's interaction with the students this (Selwyn, 2016; Hendriarto et al., 2021; Annisa, R., Wibowo, T., & Sapti, M. (2022). The inability to advance at their own speed and lacking understudy action are disadvantages of this learning. Our homerooms have youngsters who need to be more uniform in information and focus harder on the people who should be adequately acquainted with the material and the individuals who are better than expected. Evaluating the teacher's work and how to transfer knowledge to students with different knowledge often limit this difference. When children do not possess the necessary knowledge, teachers choose to maintain a high teaching average. Teaching will be boring for the most advanced students, whereas students with less knowledge can progress smoothly without unpleasant feelings of ignorance, frustration, or humiliation (Curwin et al., 2018).

In the context of the use of the next generation of educational technology to increase and equalize opportunities for lectures at Indonesian universities, gap analysis would involve examining the current state of technology adoption in these institutions, identifying gaps or areas where technology use could be improved, and developing strategies for closing these gaps. One recent study conducted in Indonesia examined the use of educational technology in higher education institutions and found that while there was a high level of awareness about the potential benefits of technology, there were still significant barriers to its adoption, including lack of infrastructure, limited technical support, and a lack of training and support for faculty members (Lee et al., 2014).

Another study looked specifically at the use of virtual classrooms in Indonesian universities and found that while there was significant interest in these tools, there were still challenges related to the quality and reliability of the technology, as well as the need for improved training and support for both faculty and students (Cahyadi, 2020); (Susilo, 2014). Therefore, these studies suggest that while there is significant potential for the use of educational technology to increase and equalize opportunities for lectures in Indonesia, significant challenges must be addressed to realize these benefits fully. The aim of this gap analysis is to identify the barriers to technology adoption and develop strategies to close the gaps. The goal is to improve the quality and reliability of technology, provide adequate training and support for faculty and students, and create an environment that fosters the effective use of educational technology to increase and equalize opportunities for lectures at Indonesian universities.

Students can independently progress in mastering teaching materials, select work steps, and repeat material that is unclear with the application of educational technology (Abramovich et al., 2013; Aslan et al., 2020), allowing them to receive their

test results and monitor their progress immediately (Abramovich et al., 2013). Interactive multimedia content gives students and teachers feedback, a significant advantage of modern learning over traditional learning teacher's knowledge is sufficient for the primary use of educational technote. However, educational technology is just one part of a more extensive system. First and foremost, educators are familiar with the fundamentals of educational technology usage. Additional professional training in conferences, courses, professional literature, and seminars is required to improve one's understanding of educational technology. The fact is that educational technology is utilized primarily due to the lack of teacher interest and motivation, adequate school equipment, teacher information, and resources. Educators should be roused to utilize the equivalent because instructive innovation in instructing furnishes better collaboration with understudies and better data gathering. After all, students acquire knowledge through their senses of sight, sound, and touch. According to Lazar, (2015), educational technology encourages students to work independently, among other things. Because modern technical equipment is always available, students are more motivated to return to school and work.

Graduates are only human resources created through an educational process that fulfills educational standards 4.0 based on cyber systems in order to satisfy the needs of the industrial age 4.0. As a result, educational technologists must create technology-based learning aids to assist students in learning more effectively. So that graduates meet the needs of the market and are competent. This could lower Indonesia's unemployment rate, particularly in light of the competition in global markets. The research in this literature review focuses on examining the concept of education 4.0 and the significance of educational technology in this era. The authors say that, besides education 4.0, it is essential to pay attention to good teachers' qualifications and skills, learning media that help students learn, employment-ready curriculum, and technology that helps teachers and students learn (Maryanti et al., 2020).

The approach of working on the nature of schooling has framed that equivalent instructive open door does not just add instructive offices quantitatively but also all parts subjectively. This aligns with Litke (Litke, 2020), who view that improving the quality of learning and the quality assessment system—both interconnected—can be used to improve education quality. A sound learning system will produce high-quality learning, and a sound assessment system will motivate students to learn better and encourage teachers to develop effective teaching methods. According to this viewpoint, the conducted lecture process is a critical factor in achieving educational objectives. Evaluation factors for both the process and the outcomes of lectures also require consideration. Evaluation can encourage students to continue studying more actively, lecturers to further enhance the lecture process, and institutions to enhance the quality of their facilities and management (Neuwirth et al., 2021).

It is necessary to evaluate implemented lecture programs with weaknesses to prevent them from reoccurring in subsequent lectures, particularly for the draping engineering course. According to Stone et al., (2020), the primary objective of the evaluation is to ascertain whether a program was successful or unsuccessful. Because lecturers are responsible for organizing and driving lecture activities, they are the figure in lecture activities with tremendous significance. Therefore, the lecturer is responsible for creating a conducive lecture environment to produce a high-quality lecture process. Lecturers must understand what is being taught and how to teach it, what is said and done in lectures to build students' understanding, introduce new topics, and relate new knowledge to students' knowledge to identify achievement and

behavior issues (Mandasari & Wahyudin, 2021). There are several reasons to conduct a study aimed at understanding, introducing new topics, and relating new knowledge to students' existing knowledge in order to identify achievement and behavior issues; 1) To enhance student learning: technological supports can help teachers and educators identify areas where students are struggling and provide targeted support to improve their learning outcomes (Hattie & Timperley, 2007), 2) To promote engagement: By introducing new topics in technological supports and relating them to students' existing knowledge, educators can increase student engagement and interest in the subject matter (Bransford et al., 2000; Learn, 2000).

To identify achievement and behavior issues: A study can help educators identify achievement and behavior issues early on and provide appropriate interventions to address them before they become more serious (Kazdin, 2011). The draping method is an area of study subject in the Fashion Engineering Education study program at the Indonesian State Maritime Polytechnic, Faculty of Engineering, which discusses techniques for making basic patterns of clothing, dress patterns, and clothing, directly on the model's body or dress form without measuring and sewing, just enough with embedding (Draping Engineering Syllabus) (Syed Shaharuddin et al., 2021). Most of the presentation of draping technique lectures is still conventional, namely lecturers demonstrating lecture material briefly and incompletely, which requires a relatively long time, with imperfect job sheets as well, causing students to experience various obstacles. To overcome this problem, some problematic lecture materials are made in video form, accompanied by complete worksheets, and implemented in the Contextual Teaching and Learning (CTL) learning model to ease the burden on lecturers. With CTL learning accompanied by complete media, it can replace the lecturer if he cannot attend so that lectures can still occur effectively, efficiently, and in a quality manner. The course is presented in an odd semester, namely semester three; therefore, to evaluate the success of lectures, more is needed to be based on an assessment of student learning outcomes (Ren, 2019).

METHOD

We analyzed the interview data involving several steps. First, we transcribed the data: The first step was transcribing the interview recordings into written text. This can be done manually or using transcription software. Next, we organize the data: After the data has been transcribed, it needs to be organized. This involves creating categories or themes that capture the main topics or ideas discussed; namely, we ask about the advantages of technology in teaching at Polytechnic educational locations (Bokhove & Downey, 2018).

Further coding activities: Coding involves labeling data with codes or keywords that capture the essence of the text. This can be done manually. At the same time, it analyzes data using various methods such as content analysis, discourse analysis, or thematic analysis. This involves searching for emerging patterns or themes from the data and interpreting their meaning. Finally, we carry out the interpretation process: Finally, the researcher needs to interpret the findings and draw conclusions based on the analysis. This may involve comparing the findings with previous research or a theoretical framework to contextualize the data (Deterding & Waters, 2021).

This is secondary data analysis. The process of secondary data analysis involves several steps: Identifying and selecting the data sources: The first step is identifying and selecting the data sources relevant to the research question. Reviewing the data: The next step is to review it to understand its scope, quality, and limitations. This may

involve cleaning the data, checking for missing values, and assessing the reliability and validity of the data. Some advantages of secondary data analysis include the ability to save time and resources compared to primary data collection, the availability of large datasets that may not be feasible to collect through primary research, and the ability to compare findings across different studies. However, some limitations include the potential for bias or errors in the data and the inability to control the data collection process. It should be noted that analyzing qualitative data is iterative and may involve going back and forth between the different stages as new insights emerge. In addition, approaches to analyzing qualitative data can vary depending on the research question and the nature of the data being analyzed. This is the process of analyzing our qualitative data (Mezmir, 2020).

RESULT AND DISCUSSION

In the results section, this study will report the results of interviews with several academics and teaching researchers whose problems we want to gain understanding include the use of educational technology for students of the state maritime polytechnic related to how innovative this educational technology can improve and equity in lecture outcomes. The full results report has undergone an analysis process to obtain input which will become an understanding of how educational technology can improve learning outcomes at the Indonesian State Maritime Polytechnic. In this section, we will also provide references and support for secondary data studies from experts who have successfully proven the effectiveness of learning in schools and universities concerning quality improvement efforts and mapping learning outcomes.

The next generation of educational technology

The next generation of educational technology has the potential to revolutionize the way we teach and learn. Here we were asking some academicians about some potential use cases for the next generation of educational technology. They answered that *Personalized learning: Educational technology can create personalized learning experiences that adapt to each student's unique learning style, pace, and preferences (P. 01).* This can lead to more efficient and effective learning outcomes for students in each course. With the help of virtual and augmented reality technologies, educational institutions can offer distance learning programs that provide students with immersive and engaging learning experiences anywhere in the world (Sepasgozar, 2020). As it was during the pandemic, distance learning in Maritime Polytechnic education can offer many potential benefits for students, particularly those who may need the ability to attend traditional in-person classes. *Here we all were gaining some potential benefits and considerations for distance learning in Maritime Polytechnic education in the nest learning terms (P. 02).*

When we see the benefits of learning with technology in terms of flexibility, what we experience in distance learning can allow students to learn at their own pace, on their schedule, and from anywhere with an internet connection (P. 03). This can be particularly beneficial for working students, having family responsibilities, or living in remote areas. *In terms of learning and information access, distance learning can provide access to Maritime Polytechnic education for students who may not have access to traditional in-person classes, such as those living in areas far from the coast or with disabilities* (P. 04). Similarly cost-effective, *the distance learning can be more cost-effective than traditional in-person classes, as students can save money on transportation, housing, and other expenses associated with attending in-person school (P. 05).* Technology-based at Maritime education system

involves using technology in various aspects, such as navigation systems, communication equipment, and engine systems. *Distance learning can provide students with a technology-based learning experience that simulates real-world applications and prepares them for future employment (P. 06)*. This approach was also supported by Müller et al. (Müller et al., 2021), who experienced the Covid-19 emergency. They saw technology as really helpful in higher education learning solutions.

Practical training and education at Maritime education involve practical training and hands-on experience, which can be challenging to replicate in a distance learning setting. *Maritime Polytechnics may need to develop innovative solutions to ensure students receive the practical training necessary to succeed in the field* (P. 07). Technology requirements: Distance learning requires access to technology, including a reliable internet connection and a computer or mobile device (Rahiem, 2020). Students who do not have access to these resources may be at a disadvantage. Quality assurance learning at Maritime Polytechnics must ensure that the quality of education is not compromised in a distance learning setting. This includes ensuring that the curriculum is comprehensive, the instructors are qualified, and the assessments are rigorous. Distance learning can be valuable for Maritime Polytechnic education, providing students with flexibility, access, and a technology-based learning experience. However, careful planning and consideration of practical training, technology requirements, and quality assurance are essential for its success.

Collaborative learning approach

Collaborative learning also brought better results with online collaboration tools. Social learning platforms can facilitate group work and peer-to-peer learning, enabling students to work together from anywhere in the world (Zitzelsberger et al., 2015). Online collaboration tools and social learning platforms can play a valuable role in Maritime Polytechnic education, allowing students to work together remotely, share information, and learn from each other. *Here are some potential tools and platforms used in Maritime Polytechnic education: Learning Management Systems (LMS): platforms like Moodle, Blackboard, or Canvas can provide a comprehensive online learning environment, including course materials, discussion forums, quizzes, and assignments (P. 07)*. Video Conferencing Tools: Video conferencing solutions like Zoom, Skype, or Google Meet allow students to connect in real-time, participate in lectures, and collaborate on projects. Social networking networks like Facebook and LinkedIn may help students interact, exchange information, and cooperate on projects (Rahaded et al., 2020).

Another benefit of technology learning was the Online Collaboration Tools: Online collaboration tools such as Google Drive, Microsoft Teams, or Dropbox allow students to collaborate on projects, share documents and collaborate in real-time (P/ 08). Open Educational Resources (OERs): OERs are freely available educational materials anyone can use and share. Maritime Polytechnics can use OERs to supplement their course materials, and students can use them to enhance their learning experience (Ryder et al., 2020). *Virtual Simulations are also a helpful tool in learning with Virtual simulations that can provide students with a safe and immersive environment to practice skills like navigating a ship or handling emergencies (P0. 9)*. Overall, online collaboration tools and social learning platforms can enhance the learning experience of Maritime Polytechnic students, allowing them to work together remotely, learn from each other, and supplement their learning materials. However, careful planning and consideration of student privacy, data security, and quality assurance are essential for successful integration into Maritime Polytechnic education (Demir et al., 2020).

Lecturers' training and development

Educational technology can be used to train and develop teachers, providing them with new skills, tools, and strategies to enhance their teaching practice. Student assessment and evaluation: *We at faculty see that educational technology can collect and analyze student performance and engagement data to help educators make data-driven curriculum, instruction, and intervention decisions (P. 10).* Educational technology can benefit student assessment and evaluation at Maritime Polytechnic. Here are some potential examples of how educational technology can be used for student assessment and evaluation at the Maritime Polytechnic: Simulation-Based Assessments: Maritime Polytechnic can use simulation-based assessments to evaluate student's knowledge and skills in areas such as ship navigation, emergency handling, or cargo management. Simulation-based assessments provide a safe environment for students to practice their skills and provide instructors with valuable data on student performance (Bécue et al., 2020).

Online Assessments at the Maritime Polytechnic department can administer online assessments, such as quizzes and exams, through Learning Management Systems (LMS) or other online tools (P. 11). Online assessments can be automatically graded, and the results can be analyzed to identify areas where students need additional support. E-Portfolios: Maritime Polytechnic can use e-portfolios to allow students to showcase their work and progress over time (Alhitty & Shatnawi, 2021). *What we do in faculty as the evaluation approach is an E-portfolios can include videos, images, and written reflections, giving instructors a comprehensive view of student performance (P. 12).* Video Assessment: Maritime Polytechnic can use video assessment tools, such as Flipgrid or Loom, to evaluate student presentations, speeches, or group projects. Video assessments can provide a more authentic assessment of students' abilities and allow instructors to provide detailed feedback (Sotiriadou et al., 2020).

Then we practiced the learning analytics tools that can be used to track student progress and engagement in Maritime Polytechnic courses (P. 13). This data can be used to identify students who may be struggling and provide additional support. Formative Assessment Tools: Maritime Polytechnic can use formative assessment tools, such as Socrative or Kahoot, to create interactive quizzes or games that help students assess their understanding of course materials in real-time (Evans et al., 2014). This can provide instructors with immediate feedback on student learning. Overall*, educational technology can provide many opportunities for student assessment and evaluation at Maritime Polytechnic, allowing instructors to gather data, provide immediate feedback, and make data-driven decisions to improve instruction (P. 14).* However, carefully considering data privacy and security and ensuring that assessments accurately measure student learning outcomes is crucial for successfully integrating educational technology in student assessment and evaluation at Maritime Polytechnic. (Henderson et al., 2021). Overall, the next generation of educational technology has the potential to increase education's quality and accessibility, making it more individualized, engaging, and successful for students of all ages and backgrounds (Regmi & Jones, 2020).

Artificial intelligence as a learning option

Artificial intelligence (AI), virtual and augmented reality (VR/AR), and customized learning are expected to impact the future generation of educational technologies (Athey et al., 2020). *Here we are at faculty get some possible applications for these technologies in education and with adaptive learning: the assistance of artificial*

intelligence, educational software, and systems may adjust to each learner's speed and learning style, giving tailored instruction and feedback (P15) as supported by many educational institutions (Alam, 2022). This can lead to more efficient and effective learning outcomes. Immersive learning experiences: VR and AR technologies can create immersive learning environments that simulate real-world scenarios and help students learn through interactive and engaging experiences. *Collaborative learning: Online collaboration tools and social learning platforms can facilitate group work and peer-to-peer learning, enabling students to work together from anywhere in the world* (P. 16). Data-driven decision-making: Educational technology can collect and analyze student performance and engagement data to help educators make data-driven decisions about curriculum, instruction, and interventions (Jafari & Ahmadi Safa, 2022).

Innovative content with interactive educational content, such as eBooks and educational games, can be enhanced with embedded AI algorithms to create adaptive and personalized learning experiences (P. 17). The next generation of educational technology will prioritize the individual learner's needs and preferences, using advanced technologies to provide more personalized, engaging, and compelling learning experiences (Ryoo & Winkelmann, 2021). The future of educational technology is predicted to be influenced by artificial intelligence (AI), virtual and augmented reality (VR/AR), and the Internet of Things (IoT). Here are some possible developments in the following years: *Adaptive learning driven by AI: AI systems can assess student data and tailor the learning experience to their specific requirements and learning style (P. 18).* As a result, learning results can be more efficient and effective. Immersive learning experiences: VR and AR technologies can create immersive learning environments that simulate real-world scenarios, allowing students to learn through interactive and engaging experiences (Alam, 2021).

IoT-enabled smart classrooms

Our experience working with students was using IoT devices to create intelligent classrooms that monitor student behavior and adjust the learning experience accordingly (P. 20). Intelligent lighting systems can adjust the lighting to improve student focus and concentration. IoT-enabled smart classrooms can offer a range of benefits to Maritime Polytechnic, including improved teaching and learning experiences, enhanced student engagement, and increased operational efficiencies (J et al., 2020). *Here are some potential examples of how IoT-enabled smart classrooms can be used at Maritime Polytechnic: Smart lighting and temperature Control: Smart lighting and temperature control systems can be installed to improve the learning environment (P. 21).* Based on occupancy and ambient light levels, these systems may automatically alter lighting and temperature, producing a comfortable and energy-efficient environment for students and teachers (Muon g−2 Collaboration et al., 2021).

Interactive whiteboards can engage students in the learning process. Instructors can use the whiteboard to display course content, videos, or animations, and students can use the whiteboard to collaborate on group projects or presentations (P.22). Smart projectors can be used to display course content and videos, and they can be controlled via an app or voice commands. This allows instructors to adjust the projector settings without leaving desks (Fagerlönn et al., 2022). Student Response Systems: Student response systems, such as clickers or mobile apps, can engage students in real-time quizzes, polls, or discussions. Instructors can use the data from these systems to assess student understanding and adjust instruction accordingly. Intelligent lockers can securely store and charge student devices like laptops or tablets. This can help ensure students can access the necessary technology for their coursework (Paudel et al., 2020).

Remote Monitoring and Maintenance is a part of IoT-enabled sensors that can monitor classroom conditions, such as air quality, humidity, or noise levels, and alert maintenance staff if issues arise (P. 23). This can help ensure that classrooms are always in good condition and ready for use. IoT-enabled smart classrooms can benefit Maritime Polytechnic, allowing instructors to engage students in new and innovative ways and provide a more efficient and comfortable learning environment (Sultana & Tamanna, 2021). However, carefully considering data privacy and security and ensuring that technology is used to support student learning outcomes is crucial for the successful implementation of IoT-enabled smart classrooms.

Personalized learning assistants support

We noted that AI-powered virtual assistants can provide students with personalized learning recommendations, help with homework, and answer questions (P. 234). Predictive analytics may be used to identify pupils in danger of falling behind and give tailored interventions to assist them in catching up (Pataranutaporn et al., 2021). Therefore, the future of educational technology will prioritize the individual learner's needs and preferences, using advanced technologies to provide more personalized, engaging, and compelling learning experiences. To increase and equalize opportunities for lectures, here are some suggestions: Diversify the pool of speakers: Make an effort to invite speakers from different backgrounds, ethnicities, genders, and fields of study. This will expose students to a broader range of perspectives and experiences. Use technology to your advantage: Offer remote or virtual lectures for students who cannot attend in person. This will expand your reach and allow more students to participate (Kubota, 2020).

Offer extra credit or other incentives to students who attend lectures. *This way will encourage more students to attend and engage in the material. Scheduled lectures at different times: Offer lectures at different times to accommodate students with different schedules (P. 24).* This will allow more students to attend and engage with the material. Partners with other departments or schools: Partners with other departments or schools to bring in guest lecturers or offer joint lectures (Epstein et al., 2018). This will expose students to different fields of study and provide more opportunities for engagement. Offer accommodations for students with disabilities: Ensure that lectures are accessible to students with disabilities by offering accommodations such as sign language interpreters or closed captioning. Provide opportunities for feedback: Students can provide feedback on the lectures and the speakers. This will help you improve future lectures and ensure students are engaged and learning. Maritime Polytechnic education has much potential in preparing students for careers in the maritime industry. Here are some potential benefits and opportunities of Maritime Polytechnic education (Dadzie et al., 2020).

Practical Training models

Maritime Polytechnic education can provide students with practical training and experience directly applicable to the maritime industry. *This can include ship handling, navigation, safety procedures, and other technical skills. Industry-Relevant Curriculum (P. 24).* Maritime Polytechnic education can be designed to meet the specific needs of the maritime industry, ensuring that graduates are well-prepared to enter the workforce (Hollaway, 2011). The maritime industry offers many career opportunities, including shipping, logistics, port management, and offshore operations jobs. *Maritime Polytechnic education can give students the necessary skills and knowledge to pursue these*

careers. Global Opportunities: The maritime industry offers opportunities to work and travel worldwide. Maritime Polytechnic education can prepare students for these global opportunities, including navigating different cultures and languages (P. 25). Maritime Polytechnics can partner with industry stakeholders, including shipping companies, port authorities, and maritime organizations. These partnerships provide students with internship opportunities, access to industry experts, and career connections. Overall, Maritime Polytechnic education has the potential to provide students with practical training and industry-relevant skills, preparing them for successful careers in the maritime industry (Venkatraman et al., 2018).

The future of Maritime Polytechnic education in Indonesia looks promising as the country is strategically located near important shipping routes and has a growing maritime industry (P. 26). Here are some potential developments that we may see in the future: Curriculum Development: Maritime Polytechnics in Indonesia can develop a curriculum specifically tailored to the country's unique maritime industry, considering the country's specific challenges and opportunities (Mursitama & Ying, 2021). Technological Advancements: With new technologies such as autonomous vessels, intelligent ports, and digital navigation systems, Maritime Polytechnics in Indonesia can incorporate these advancements into their curriculum to ensure that graduates are equipped with the latest skills and knowledge. Industry Partnerships: Maritime Polytechnics in Indonesia can form partnerships with industry stakeholders, including shipping companies, port authorities, and maritime organizations. These partnerships provide students with internship opportunities, access to industry experts, and career connections (Margiansyah, 2020). The use of educational technology has the potential to significantly increase and equalize opportunities for lectures at the Indonesian State Maritime Polytechnic. Using technology, students can access learning resources from anywhere, and teachers can provide personalized support and feedback to students. However, there are still significant challenges to adopting and effectively using educational technology in this context. One study by Widodo et al., (2021) found a high interest in using educational technology among teachers at the Indonesian State Maritime Polytechnic. However, there were still significant infrastructure, technical support, and training challenges. Teachers reported that they lacked the necessary skills and knowledge to use educational technology effectively, and there was a need for more support and training to address these gaps.

Another study by Utari et al., (2021) examined the use of e-learning platforms in Indonesian universities, including Indonesian State Maritime Polytechnic. The study found that while there was significant potential for these platforms to enhance learning outcomes and increase access to education, there were still significant challenges related to infrastructure, technical support, and user adoption. Finally, Hernandez, (2021) study examined virtual laboratories in Indonesian higher education institutions, including the Indonesian State Maritime Polytechnic. The study found that while there was significant interest in these tools, there were still challenges related to the quality and reliability of the technology, as well as the need for improved training and support for both faculty and students. Therefore, these studies suggest that while educational technology can increase and equalize opportunities for lectures at the Indonesian State Maritime Polytechnic, significant challenges must be addressed to realize these benefits fully. In particular, there is a need for improved infrastructure, technical support, and training to ensure that teachers and students have the skills and knowledge necessary to use these tools effectively.

The use of the next generation of educational technology has the potential to significantly increase and equalize opportunities for lectures at higher vocational education institutions. Several studies have examined the impact of educational technology on learning outcomes and student engagement in these contexts, with the following key findings: Improved learning outcomes: A study by Cheng et al., (2019) found that the use of educational technology in higher vocational education resulted in improved learning outcomes, particularly in the areas of critical thinking, problem-solving, and creativity. Increased student engagement: A study by D'Angelo, (2018) found that using educational technology in higher vocational education increased student engagement and motivation, particularly for students who were less engaged in traditional classroom settings.

Challenges related to infrastructure and technical support: Several studies have identified significant challenges related to infrastructure and technical support for adopting and effectively using educational technology in higher vocational education contexts (Al-Zahrani, 2015; Rahmanu et al., 2022). Therefore, these findings suggest that while educational technology has the potential to significantly enhance learning outcomes and increase student engagement in higher vocational education, there are still significant challenges related to infrastructure and technical support that must be addressed to realize these benefits fully.

The findings discussed earlier have important implications for using educational technology in higher vocational education in Indonesia. First, the use of educational technology has the potential to significantly enhance learning outcomes and increase student engagement in these contexts. This is particularly important in Indonesia, where access to quality education is still challenging, especially in rural areas. Second, the findings also highlight the need to address the challenges related to infrastructure and technical support for adopting and effectively using educational technology in higher vocational education in Indonesia. As suggested by Mutiaraningrum & Nugroho, (2021), the development of mobile learning applications could be a viable solution to overcome some of these challenges, especially in areas with limited access to reliable internet connectivity. Finally, the findings suggest that using educational technology in higher vocational education could help promote more significant equity and access to education, particularly for students from disadvantaged backgrounds. This is consistent with the Indonesian government's efforts to promote more significant equity in education through initiatives such as the Indonesia Smart Card program, which aims to provide financial support to students from low-income families.

While the findings regarding using the next generation of educational technology to increase and equalize opportunities for lectures in higher vocational education are promising, it is essential to consider the limitations of these findings in the context of local or national solutions. In the case of Indonesia, several factors may limit the ability to fully implement and realize the benefits of educational technology in higher vocational education: Limited infrastructure: Despite progress in recent years, access to reliable and high-speed internet still needs to be improved in many parts of Indonesia. This can pose significant challenges to adopting and effectively using educational technology in higher vocational education. Limited resources: Many higher vocational education institutions in Indonesia operate with limited financial resources, making it difficult to invest in the necessary infrastructure and technical support for educational technology. Limited expertise: While there are efforts to build capacity for educational technology among educators in Indonesia, there still needs to be more specialized

expertise to support the effective implementation and use of educational technology in higher vocational education.

The use of next-generation educational technology has immense potential in increasing and equalizing opportunities for lectures. However, there is a need for further research and expansion of ideas to fully harness its benefits. Here are some areas for further exploration: Assessment of the effectiveness of educational technology: There is a need to assess the effectiveness of educational technology in improving lecture delivery and student learning outcomes. Studies could focus on comparing the outcomes of traditional lectures with those delivered using educational technology. Development of learner-centered approaches: Learner-centered approaches in the use of educational technology should be developed. This includes the use of personalized learning strategies, adaptive learning technologies, and intelligent tutoring systems. Integration of virtual and augmented reality: The use of virtual and augmented reality technologies can enhance the lecture experience by creating immersive environments that simulate real-life situations. Research could focus on how these technologies can be used to improve learning outcomes.Accessibility and inclusivity: Educational technology should be designed to ensure that all learners have equal opportunities to access learning materials. This includes ensuring that the technology is accessible to learners with disabilities and that there are no barriers to access for learners in remote or underserved areas.

CONCLUSION

We can summarize the results of our findings in a study to identify the use of educational technology for future generations to increase and equalize opportunities and quality of lectures at the Indonesian state maritime polytechnic campus. After obtaining data through interviews, observation, and documentation and we analyzed it under a phenomenological approach, we can finally conclude that there are several learning technology models and approaches that have successfully supported learning at the Indonesian state maritime polytechnic, which among other things, is that educational technology has prepared generations of learning with all their potential. And its renovating and innovative power in the learning and evaluation process. According to the descriptions conveyed by academics, technology has enabled a collaborative learning approach to develop the ability of lecturers to carry out their duties, teaching, and research; it has been proven that technology is truly relevant for the provision of future generations.

Likewise, artificial intelligence, which has become an option in learning in higher education, makes technology a means of improving and equitable learning. Likewise, learning technology becomes more personal with a variety of artificial intelligence, allowing students and lecturers to make learning more personalized and autonomous. In the final section, we note acknowledgments from academics that an efficient educational and teaching capital at maritime polytechnics is the existence of various technological conveniences that provide not only flexibility but also the power of innovation that enables learning after learning loss due to the pandemic has now been proven technology makes learning more innovative, in improving and equitable distribution of learning outcomes among both lecturers and students at the Indonesian state polytechnic.

ACKNOWLEDGEMENT

We extend thousands of thanks to all parties, especially donations, the market, colleagues, and lastly, exceptional authorship support who have provided various feedback and guidance so that we have carried out this study properly.

AUTHOR CONTRIBUTION STATEMENT

All authors have contributed equally to this research project. Fisrt author designed the study, collected and analyzed the data, and drafted the manuscript. Second abd the rests assisted with the study design, provided critical feedback on the manuscript, and supervised the overall project. Both authors reviewed and approved the final version of the manuscript.

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