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Page: 328-340

The Impact of the COVID-19 Pandemic at the Makassar Shipping Science Polytechnic

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Abstract. The spread of COVID-19 is a threat to humanity because this pandemic has forced many global activities to close, including educational activities. To reduce the spread of the virus, educational institutions are forced to turn to e-learning using available educational platforms, despite the challenges that challenge this transformation. To further explore the potential challenges faced by learning activities, this study focuses on e-learning from the perspective of cadets and teachers in using and implementing e-learning systems in universities during the COVID-19 pandemic. This research targets the community, including cadets and teaching staff at the Engineering Study Program at the Makassar Marine Science Polytechnic. A descriptive-analytical approach was applied, and statistical methods analyzed the results. There are two types of questionnaires designed and distributed: student questionnaires and teacher questionnaires. Four dimensions have been highlighted to achieve the expected results: the extent to which e-learning is used during the COVID-19 pandemic, the advantages, disadvantages, and application of E-learning at the Makassar Shipping Science Polytechnic. By analyzing the results, we achieved an exciting result using some of the problems, challenges and advantages of using an e-learning system over traditional education in higher education in general and during times of emergency.

Keywords: *Covid-19; Pandemic; E-learning; Higher Education; Information Technology*

Abstrak. Penyebaran COVID-19 menjadi ancaman bagi umat manusia, karena pandemi ini memaksa banyak kegiatan global ditutup, termasuk kegiatan pendidikan. Untuk mengurangi penyebaran virus, institusi pendidikan terpaksa beralih ke e-learning menggunakan platform pendidikan yang tersedia, meskipun ada tantangan yang dihadapi transformasi mendadak ini. Untuk lebih mendalami potensi tantangan yang dihadapi kegiatan pembelajaran, fokus kajian ini adalah pada e-learning dari perspektif taruna dan pengajar dalam menggunakan dan mengimplementasikan sistem e-learning di politeknik negeri selama masa pandemi COVID-19. Penelitian ini menyasar masyarakat yang meliputi taruna dan staf pengajar pada Program Studi Teknika di Politeknik Ilmu Pelayaran Makassar. Pendekatan deskriptif-analitis diterapkan dan hasilnya dianalisis dengan metode statistik. Ada dua jenis angket yang dirancang dan disebarkan, yaitu angket siswa dan angket pengajar. Empat dimensi telah disorot untuk mencapai hasil yang diharapkan, yaitu sejauh mana penggunaan e-learning selama pandemi COVID-19, kelebihan, kekurangan dan hambatan penerapan E-learning di Politeknik Ilmu Pelayaran Makassar. Dengan menganalisis hasil, kami mencapai hasil yang menggembirakan yang menyoroti beberapa masalah, tantangan, dan keuntungan menggunakan sistem e-learning daripada pendidikan tradisional di pendidikan tinggi pada umumnya dan selama masa darurat.

Kata Kunci: *Covid-19; Pandemi; E-learning; Pendidikan Tinggi; Teknologi Informasi*

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Vol: 7 Number 2, April 2022
Page: 328-340

INTRODUCTION

The unexpected closure of educational institutions due to the emergence of COVID-19 prompted authorities to suggest adopting alternatives to traditional learning methods in an emergency to ensure that students are not left without learning and to prevent the spread of the epidemic.

The formal learning system with the help of electronic resources is known as e-learning. However, teaching can be done in (or outside) the classroom. The use of computer and internet technology is an important component of e-learning (Aboagye et al., 2020). Traditional educational methods were replaced by e-learning when the COVID-19 virus emerged because social gatherings in educational institutions were considered an opportunity for the virus to spread. E-learning is the best option available to ensure the epidemic does not spread. Despite the challenges and numbers being studied, it guarantees spatial distance, suggesting that students are less likely to benefit from this type of education (Lizcano et al., 2020).

Information and communication technologies (ICTs) offer unique educational and training opportunities to enhance teaching and learning and innovation and creativity for people and organizations. In addition, the use of ICT can encourage the development of educational policies that encourage a creative and innovative educational institution environment (Abdullah et al., 2019; Altawaty et al., 2020; Selim, 2007). Therefore, attention is paid extensively to the efforts and experiences associated with this type of education. Most universities in some developing countries commonly use this technology. In the educational environment, there are many learning-related processes involved, and a large amount of potential rich data is generated in educational institutions continue to extract knowledge from those data for a better understanding of learning-related processes (Aljawarneh, 2020; Lara et al. ., 2020; Lizcano et al., 2020).

E-learning plays a role in existing educational settings as it transforms the entire education system and becomes one of the greatest topics of choice for academics (Samir Abou El-Seoud et al., 2014). It is defined as using various types of ICT and electronic devices in teaching (Gaebel et al., 2014). Most of today's students want to study online and graduate at universities or polytechnics worldwide, but they can't go anywhere because they live in remote places without good communication services.

Due to e-learning, participants can save time and effort by living in a place far from the university where they are enrolled, so many scholars support online courses (Ms & Toro, 2013).

Many users of e-learning platforms see that online learning helps ensure that e-learning can be easily managed and students can easily access teachers and teaching

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

materials (Mukhtar et al., 2020). It also helps reduce the effort and costs of travel and other costs that come with traditional learning. E-learning significantly reduces the effort of administration, preparation and recording of lectures, attendance, and leaving classes. Teachers and students see that online learning methods encourage pursuing lessons from anywhere and in difficult circumstances that prevent them from reaching universities and schools.

Several studies have addressed the opportunities and challenges associated with the transition to traditional learning over e-learning. One of the main reasons for the faltering of e-learning initiatives is the lack of good preparation for this experience.

A study that aims to examine the challenges of cadets on how to deal with e-learning during the outbreak of COVID-19 and to examine whether cadets are ready to learn online or not is presented (Aboagye et al., 2020). The study concludes that a mixed approach that combines traditional and e-teaching should be available to learners. Another study exploring the e-learning process among students who are familiar with web-based technologies to advance their self-study skills is described in (Sathishkumar et al., 2020). The study results show that e-learning has become popular among students in all educational institutions during the lockdown due to the COVID-19 pandemic.

A study that aims to investigate the characteristics, benefits, drawbacks, and features that affect E-learning has been presented (Ms & Toro, 2013). Several demographic features such as behavior and cultural background impact student education in the E-learning domain. Therefore, for lecturers to design educational activities to make learning more effective, they must understand these features. The study was applied to students in Lebanon and the UK to help instructors understand what scholars expect from a learning management system.

Analyzing the effectiveness of E-learning for cadets at the university level has been introduced by (Ali et al., 2018). The questionnaire was applied to 700 students, 94.9% of whom used different e-learning techniques and tools. To measure the reliability and internal consistency of the factors, Cronbach's alpha test was applied. To take variables and calculate loading factors in the study, exploratory feature analysis was used. The results showed that students supported that E-learning was easy to use, time-saving, and affordable.

Various predictions of e-learning for educational purposes have been illustrated in (Samir Abou El-Seoud et al., 2014). This study aims to show how to keep students motivated in e-learning. Evaluation of student motivation for online learning can be challenging due to the lack of face-to-face contact between students and teachers. This study shows that

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

one way to encourage students' motivation is to let them fill out an online motivational assessment form. This study suggests five research hypotheses to be examined to identify which hypotheses should be accepted and which should not be.

The strength of the relationship between student motivation and e-learning is illustrated in (Harandi, 2015). Data were collected from cadets at Tehran Alzahra University, and Pearson correlation coefficients were utilized for data analysis. The results of this study reveal that several points should be considered before using E-learning. However, this study was limited to one culture, which may limit the generalizability of the results.

The study described in (Oludare Jethro et al., 2012) shows that e-learning is a new environment for scholars, as it illustrates how to make e-learning more effective in education and the advantages of using e-learning. The results showed that cadets were willing to learn more with less social communication with other cadets or lecturers.

A study that aims to highlight and measure the four Critical Success Factors from student insight is described (Selim, 2007). These factors are an instructor and student characteristics, technology structure, and university support. The results showed that the characteristics of the instructor were the most critical, followed by IT infrastructure and university support in the success of e-learning. The most critical factor for the success of e-learning is student characteristics.

The described work has tried to emphasize the importance of e-learning in modern teaching and described its advantages and disadvantages. Also, a comparison with Instructor-Led Training (ILT) and the possibility of implementing E-learning as a substitute for teaching in the old classroom are discussed. In addition, this study shows the main weaknesses of ILT in institutions and how using E-learning can help overcome these problems.

The aim of the study by (Gaebel et al., 2014) was to conduct a survey on the types of E-learning organizations, their skills, and their anticipation for the future. Blended and online learning counts. Some questions relate to intra-institutional management, arrangements and services, and quality assurance. The survey results show that from 38 different countries and systems, 249 organizations broadly understand the common causes for the increased use of e-learning.

The study in (Yengin et al., 2011) illustrates that the most vital role in e-learning design is that of online lecturers. Therefore, considering issues that impact lecturer performance must be taken into account. One of the features that affect the usability of the system and lecturer presentation is satisfaction. The results showed, to produce a simple model called “E-learning Success Model for Instructor Satisfaction” related to

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

the public, logical and technical communication of instructors across e-learning systems, features related to teacher satisfaction in e-learning systems were examined.

A comparison between different E-learning tools in terms of objectives, benefits and drawbacks is presented in (S. Aljawarneh et al., 2012). Comparisons help in determining when to use each tool. The results show that instructors and students prefer to use MOODLE over Blackboard in an e-learning environment. One of the main challenges facing the E-learning environment is the issue of security because security is not incorporated into the active learning development process.

The effect of e-learning at Payame Noor Hamedan University, Iran, on the innovation and material awareness of chemistry cadets (Zare et al., 2016). This study used a control group pre-test/post-test experimental design. The data analysis findings utilizing an independent t-test showed significantly better scores on the experimental group's calculated variables, information, and innovation. Consequently, E-learning is beneficial for knowledge acquisition and innovation among chemistry cadets, and that greater opportunities for E-learning should be provided for a wider audience.

A study in (Arkorful & Abaidoo, 2015) aims to explore the literature and provide a study with a theoretical context by reviewing several publications made by different academics and universities on the definition of E-learning, its use in education and learning in educational institutions. Higher education. The general literature describes the pros and cons of E-learning, indicating that it needs to be enforced in higher education for teachers, supervisors and students to experience the full benefits of its adoption and implementation.

Assessing the effectiveness of learning e-learning is studied (Zare et al., 2016). This analytical study used the Medline and CINAHL databases and the Google search engine. This study uses a closed review article and an English meta-analysis. Thirty-eight papers, including journals, books, and websites, were investigated and categorized from the results obtained. General advantages of E-learning such as promotion of learning and speed and learning process due to individual needs are discussed. The study results show a positive effect of E-learning on the teaching and learning process, so it is proposed to use this educational method more, which requires the necessary basis to be established.

It is important to focus on analyzing learner and student characteristics and motivating students to ensure their involvement in e-learning. Also, it is necessary to focus on the impact and level of teacher acceptance of e-learning. The age difference between teachers and students indicates that teachers receive most of their studies and teaching skills through traditional teaching and

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

learning methods, making their acceptance of e-learning different from students' acceptance of modern e-learning methods and students. education in general.

RESEARCH METHODS

The descriptive-analytical method was used for this study and a five-point Likert scale range was calculated based on (1) Most disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Most agree, with analysis of the results using a statistical application called the Statistical Package for the Social Sciences (SPSS).

This study targets a sample community that includes teaching staff and cadets in the Engineering Study Program at the Makassar Marine Science Polytechnic. Scientific Limitation: Assessment of how E-learning is applied in polytechnics. Administration Sector: Makassar Marine Science Polytechnic Study Program. Period: Year 2020. Human Resources: Teaching staff and cadets

Sample: this study involved two types of questionnaires in preparing and developing: one questionnaire for students and another for teaching staff. The following details were obtained after the questionnaires were randomly distributed and collected individually. The research sample was selected based on awareness of the size of the population:

Student Questionnaire: The number of questionnaires distributed was 140 copies, with no invalid copies and five missing copies. Therefore, the analyzed copy was 135.

Teaching Staff Questionnaire: The number of questionnaires distributed was 20 copies, while 20 valid copies were returned without the invalid or the lost copies. Some of the demographic characteristics are shown in Table 1.

Table 1. Distribution of student study sample

Character name	Count	Percentage
1. *Gender*		
Male	78	57,8%
Female	57	42,2%
2. *Age*		
18-20	65	48,1 %
21-23	35	25,9%
24-26	23	17 %
Older	12	9%
3. *Semester*		
1-3	68	50,4%
4-5	23	17%
6-8	20	14,8%
Above	24	17,8%
Total	135	100%

This study emphasizes on four dimensions to achieve the expected results as follows:

1. To what extent is the use of E-learning in the Makassar PIP Engineering Study Program?
2. The advantages of E-learning.
3. Lack of E-learning.

The statistical relationship of Means and Materiality was used to analyze the results. By evaluating the findings, we obtained important information based on these statistical relationships according to the ranking of the questions, as shown in Table 2 and Table 3.

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

Table 2. Descriptive statistics of student's perspective

Dimension	Number of Inquiries	Lewest mean	Highest mean
The extent of using E-Learning	11	2	4,13
Advantages of E-learning	9	3,79	4,41
Disadvantages of E-learning	7	3,63	3,91
Obstacles to implementing E-learning	6	3,59	3,95

Tabel 3. Descriptive statistics of teaching staff perpective

Dimension	Number of Inquiries	Lewest mean	Highest mean
The extent of using E-Learning	12	2,09	4,55
Advantages of E-learning	7	3,41	4,23
Disadvantages of E-learning	7	2,91	3,95
Obstacles to implementing E-learning	7	3,59	4,14

Analysis of the data as a statistical relationship regarding students' perspectives is shown in Table 2.

Dimension 1: the extent to which E-learning is used in the Makassar PIP Engineering Study Program. Questions (6), (7) and (10) have the same materiality and question (6) is chosen because it has a lower standard deviation, which states that "e-learning technology is used for scientific research purposes" with materiality of 82.6% and the mean is 4.13, while the question number (7), which states "Search engine is used to obtain curriculum needs". However, question (2), which states that "Internet is available to cadets in the faculty" has the lowest materiality of 40% and an average of 2.

Dimension 2: E-learning advantages. The question number (1) states that "E-learning contributes to improving your education level" has the highest materiality of 88.2% and an average of 4.41. However, question number (7), which states that "E-learning reduces the burden because learning becomes a conversation between teaching staff and cadets, not traditional learning", has the lowest materiality of 75.8% and an average of 3.79.

Dimension 3: E-learning weaknesses. Questions (5) and (6) have the same materiality, and question number (5) was chosen because it has a lower standard deviation, which states that "E-learning reduces the burden on teaching staff and increases the burden on students" with the materiality of 75.4% and an average of 3.77. However, question number (1), which states that "E-learning isolates you from the community by connecting you to your computer for extended periods", has the lowest materiality, 72.6% and an average of 3.63.

Dimension 4: barriers to E-learning. The question number (3) states that "the lack of internet in the faculty to implement E-learning" has the highest materiality of 79% and an average of 3.95. However, questions (4)

ISSN: p-2540-8763 / e-2615-4374
DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

and (5) have the same materiality, and question number (5) has been chosen because it has a lower standard deviation, which notes that "Less experience of students with E-learning techniques" with the materiality of 71.8% and an average of 3.59.

Analysis of the data as statistical relationships regarding the perspective of teaching staff and critical analyzes of mean and materiality are given in Table 3

Dimension 1: the extent to which E-learning is used in the Makassar PIP engineering study program. The question number (10), which is about "Use email to communicate with coworkers," has the highest materiality of 91% and an average of 4.55. However, question number (2), which states that "internet access is always available for teaching staff in the faculty", has the least materiality of 41.8%, and the average is 2.09.

Dimension 2. Advantages of E-learning. Question number (4), which states that "E-learning contributes to the improvement of students' skills in using computers," has the highest materiality of 84.6% and an average of 4.23. However, question number (7) states that "E-learning reduces the burden because learning becomes a conversation between teaching staff and students, not traditional learning," with the lowest materiality of 68.2% and an average of 3.41.

Dimension 3: E-learning weaknesses. Question number (6) states that "E-learning requires financial capability compared to traditional education," which has maximum materiality of 79% and an average of 3.95. However, question number (3), which reports that "students face a greater burden during the educational process while reducing the burden on teaching staff", had the lowest materiality of 58.2% and an average of 2.91.

Dimension 4: barriers to E-learning. Questions (4) and (7) have the same materiality, and question number (4) was chosen because it has a lower standard deviation, which states that "There is a lack of internet in the faculty to implement e-learning" with the materiality of 82.8% and an average 4.14. However, questions (3) and (6) have the same materiality and question (6) is chosen, which states that "E-learning requires high costs" has the lowest materiality of 71.8% and an average of 3.59.

DISCUSSION

Cadet perspective

As shown in Table 4, we found the value of T-Test = 8,733 and P-Value = 0.00 as far as using E-learning during the pandemic. The value of T-Test = 22.86 and P-Value = 0.00 for E-learning excellence. The value of T-Test = 12.786 and P-Value = 0.00 for lack of E-learning. E-learning barriers in the last dimension are the value of T-Test = 11.961 and P-Value = 0.00. Thus, all T-Test values are greater than T table values = 1.96. On the other hand, all P-Values are smaller than the significance level = 0.05. Thus, there are

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DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

statistically significant differences from the cadets' point of view in each of the four sample dimensions.

Tabel 4. Statistical tests (student's perpective)

Dimension	Mean	STDev	T-Test	*P*-value
The extent of using E-Learning	3,44	0,590	8,733	0,00
Advantages of E-learning	4,13	0,574	22,86	0,00
Disadvantages of E-learning	3,78	0,705	12,786	0,00
Obstacles to implementing E-learning	3,75	0,732	11,961	0,00

Teaching staff perspective

As shown in Table 5.5, the extent to which E-learning is used is T-Test = 6.021 and P-Value = 0.00, the advantages of E-learning are T-Test = 9.015 and P-Value = 0.00 , the disadvantage of E-learning is T-Test = 3.813 and P-Value = 0.001, and the barriers for E-learning are T-Test = 6.505 and P-Value = 0.00, respectively. If the T-Test value is higher than the T table value = 1.96, the P-Values are smaller than the significance level = 0.05. There were statistically significant differences from the perspective of the teaching staff in each of the four research dimensions.

The data analysis of the four dimensions is summarized as follows:

The level of use of e-learning: the findings show that the cadets' approval of the use of e-learning and the point of view of the teaching staff is (Agreement), where the averages are (3.44) and (3.59). As it is said that the influence of e-learning at Payame Noor Hamedan University, Iran on innovation and material awareness of cadets is examined in (Zare et al. 2016). This study used a control group pre-test/post-test experimental design. The data analysis findings utilizing an independent t-test showed significantly better scores on the experimental group's calculated variables, information, and innovation. Consequently, E-learning is beneficial for knowledge acquisition and innovation among cadets, and that greater opportunities for E-learning should be provided for a wider audience.

Higher education. The advantages of e-learning: the results of the consideration of this dimension indicate that the agreement on the superiority of e-learning from the perspective of cadets and teaching staff is (Agreement), where the mean from the cadets' perspective is (4.13) and the mean from the teaching staff perspective is (3.99). This is in line with (Arkorful & Abaidoo 2015) opinion to explore the literature and provide studies with a theoretical context by reviewing several publications made by different academics and universities about the definition of E-learning,

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Vol: 7 Number 2, April 2022
Page: 328-340

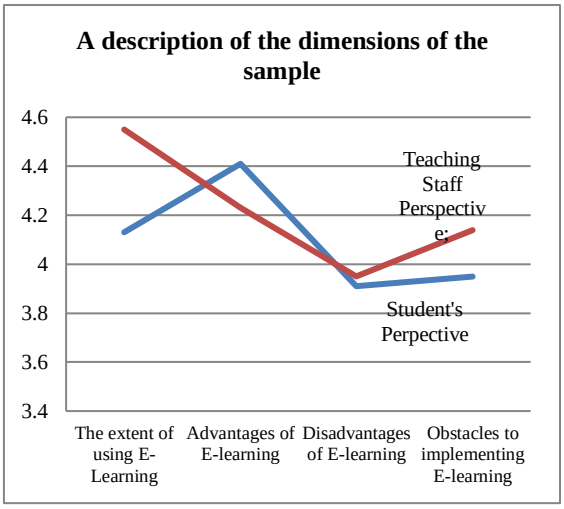
its use in education and learning in educational institutions. The general literature describes the pros and cons of E-learning, indicating that it needs to be enforced in higher education for lecturers, supervisors and cadets to experience the full benefits of its acceptance and implementation. The use of telecommunication technology for learning activities in polytechnics in Indonesia has become more conducive with the issuance of a Decree of the Minister of the Ministry of National Education (SK Mendiknas) in 2001, which encourages conventional polytechnics to provide distance education (dual mode).

Dimensions which are weaknesses of e-learning: This shows that the weakness of cadet acceptance from e-learning is (Agreed) from the average (3.78), and the opinion of the teaching staff is (Not yet determined) from the average (3.35). It is essential to focus on analyzing learner and cadet characteristics and motivating cadets to ensure their involvement in e-learning. Also, it is necessary to focus on the impact and acceptance rate of lecturers on e-learning. The age difference between lecturers and cadets indicates that lecturers receive most of their studies and teaching skills through traditional teaching and learning methods, making their acceptance of e-learning different from cadets' acceptance of modern e-learning methods and cadets, education in general.

Comparison between two perspectives

As shown in Fig. 1, it is seen that the viewpoints of teaching staff and students in all four study dimensions are identical. This suggests that they are nearly standardized, with slight variation in the third dimension of the data considered for the disadvantages of e-learning during the Covid-19 pandemic. This factor reached agreement from the point of view of the teaching staff and from the point of view of the cadets hesitant to reach an agreement on the results.

Picture 1. A description of the dimensions of the sample



Findings based on the perspective of cadets

The cadets believe that e-learning is used, and one of the most significant uses is the replica of the scientific method learned in electronic/multimedia form. The cadets agree that e-learning is valuable, helps them feel safe, and raises their academic standards. The cadets claim that the introduction of e-learning is complex, and the low quality of internet

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DOI: 10.26618/jed.v%vi%i.6871
Vol: 7 Number 2, April 2022
Page: 328-340

services is the biggest obstacle to its implementation.

Some of the benefits of e-learning include, according to (Rohmah 2016), (1) e-learning can shorten learning time and make study costs more economical, (2) E-learning facilitates interaction between students and materials, (3) Students can share information and can access learning materials at any time and repeatedly, with such conditions students can further solidify their mastery of learning materials (4) With e-learning the process of developing knowledge does not only occur in the classroom but with the help of computer equipment and networks. , students can be actively involved in the teaching and learning process. The cadets pointed out that there are limitations in e-learning, and its biggest weakness is reducing the workload of teaching staff and increasing pressure on cadets.

Findings based on the teaching staff's perspective.

Teaching staff believe that e-learning is valuable and helps develop cadets' technology skills is one of the most important positive elements. The teaching staff agrees that e-learning is common and faculty member ownership via email and other electronic services is the most significant use. The teaching staff agrees that there are barriers to the introduction of e-learning and its high implementation cost is one of the main difficulties. The teaching staff accepts that e-learning has its most significant drawbacks and requires financial support relative to traditional learning. Thus the application of e-learning at the Polytechnic is expected to provide benefits, including (1) An increase in the interaction of cadets with each other and with lecturers, (2) Availability of unlimited learning resources, (3) E-learning that is appropriately developed will be effective in improving the quality graduates and the quality of polytechnics (4) The formation of a learning community that interacts, gives and receives each other and is not limited to one location (5) Improves the quality of lecturers because it is possible to explore the information more broadly and even not limitedly.

Pedagogical aspects

Each e-learning strategy follows commonly known learning theories, namely behaviorism, cognitivism, or constructivism (Mödritscher, 2006). Furthermore, each didactic strategy has a more or less substantial impact on the factors that influence the learning process and self-assessment of the characteristics of students. Therefore, based on what has been achieved through the opinions of teaching staff and students, we find that specific characteristics of learners, in particular, motivation need to be analyzed. As an appropriate pedagogical step, it is also necessary to choose an e-learning strategy that suits the characteristics of cadets and the

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Vol: 7 Number 2, April 2022
Page: 328-340

electronic environment in which they currently live.

CONCLUSION

This study aims to identify the main issues and challenges by extrapolating the opinions of cadets and lecturers about the use of e-learning systems in vocational polytechnics during the Covid-19 pandemic. The sample of the research community consisted of cadets and teachers at the Engineering Study Program at PIP Makassar. A descriptive-analytical approach has been applied with statistical analysis of the results, despite facing many problems and challenges. By analyzing the results, we have achieved encouraging results to highlight some of the problems, challenges and benefits of using e-learning systems in the vocational higher education sector.

Professionalism is always essential in the implementation of e-learning in vocational colleges. Based on the study results, cadets believe that e-learning provides e-learning. The main obstacle to e-learning is the low quality of Internet services at PIP Makassar during the pandemic. Study program members agree that e-learning is helpful in improving students' computer skills,

Institutions must provide internet services to cadets and teaching staff with sufficient computer equipment to implement e-learning. Modern electronic libraries and dedicated classrooms with all kinds of tools and equipment are also needed to implement e-learning instead of coming to the main campus. Apart from that, the role and importance of focusing on many things related to the characteristics of students, such as the characteristics of the background knowledge of cadets and how to motivate cadets, as one of the pedagogical impacts. So it is very important to do further research related to infrastructure readiness as supporting infrastructure. Also, research on motivating students (cadets) in the Covid-19 pandemic situation.

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