Student Feedback on Using LMS-Assisted POE2WE Learning Model to Facilitate Digital Learning in Society 4.0

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Abstract : In general, the competence of students who learn to dare is assessed to have decreased. The form of learning that can be used as a solution in the era of the industrial revolution 4.0 is distance learning. This research method is a quantitative descriptive study that aims to describe and analyze student responses regarding the application of the LMS-based POE2WE learning model. The research respondents were 233 students from two universities who came from the Physics Education study program, D4 Nursing and Professional Nurses in Tasikmalaya City. Data collection techniques used are questionnaires and observation. The questionnaire consisted of 15 positive statements related to the application of the LMS-based POE2WE learning model in supporting distance learning in the era of the industrial revolution 4.0. The results of the analysis obtained that from 233 students the average result was 4.01. This means that the average student agrees that the application of the LMS-based POE2WE Learning Model provides a good response and. This is an indication that the implementation of learning with the POE2WE model can be carried out in various learning backgrounds. The problems faced are related to increasing quotas and poor internal networks.

Keywords :LMS; POE2WE; Society 4.0

INTRODUCTION

The COVID-19 pandemic poses significant challenges to human life globally. The handling of Covid-19 was overcome by the implementation of the PSBB and Lockdown policies as well as the implementation of health protocols. PSBB and Lockdown have had a major impact on various sectors, including the education, transportation, and economic sectors (ILO, 2020; Reimers et al., 2020) .

The impact of the education sector in Indonesia includes the policy of abolishing the National Examination and temporarily closing schools (Dwi Sulisworo, 2021).1The impact of the transportation sector in Indonesia is the prohibition of going home (Kemenhub, 2020). The impact on the economic sector is declining economic growth (Dwi Sulisworo, 2021). So in this case, the community's adaptive capacity is needed so that it doesn't get worse.

Adaptation of society when facing the Covid-19 pandemic is commonly referred to as the new normal. New normal is a community effort to continue to live life by implementing health protocols. New normal behavior includes getting used to wearing masks, discipline in maintaining cleanliness, especially hands regularly and correctly, discipline in applying cough etiquette, maintaining physical distance (Nuryatin, 2020). Physical distancing behavior has an impact on the learning system in the form of a learning policy from home.

The learning activities of students around the world, including Indonesia, have had their learning activities disrupted due to a virus which is harmful to health, and learning activities

have been diverted to learning activities at home. The study from home policy is a form of government effort to continue to educate the nation's generation in the midst of the Covid-19 Pandemic. This policy makes educators and students involved in synchronous or asynchronous interactions. Synchronous interaction allows educators and students to interact at the same time even in different places while asynchronous allows educators and students to interact in different times and places (Oye et al., 2012; Shahabadi & Uplane, 2014).

Meanwhile, the 21st century demands student characteristics, including: (1) Learning and innovation skills: critical thinking and problem solving in collaborative and innovative communication and creativity; (2) Digital literacy skills: new media literacy and ICT literacy; technological literacy; human literacy; and (3) Life and career skills: having flexible and adaptive initiatives, and social skills in intercultural interactions, productive and accounTable leadership skills, and responsibility.

Technology has an effect on education, for example in learning methods, learning media, and assessment (Putra & Sujarwanto, 2017; DeVore & Singh, 2020; Wilcox & Pollock, 2019, Formanek et al., 2019). Examples of technologies that affect education include the internet and Android networks. The internet is used as a learning resource apart from books and educators. In fact, the use of Android as a basis for learning media is one of the learning styles in the 21st century (Climag et al., 2014). Technological developments can be used to support online learning at home (Crawford et al., 2020; Sintema, 2020).

According to Moore, Dickson-Deane, & Galyen (2011) online learning is learning by using internet networks with accessibility, connectivity, flexibility, and the ability to make interactions in learning activities. Online learning is a new thing for the majority of students and currently students are still in a transition period to learn online so they need to be well prepared. Bao (2020) mentions strategies for dealing with the online learning transition period, namely preparing several backup plans if the initial plan in online learning has problems, dividing learning materials into more concise units (than during face-to-face learning) so that students are more focused, emphasizing on the use of audio or the voice of educators so that there is a sense of teaching, educators work in teams to support online learning, emphasize active learning contextually related to the student's environment, combine online learning with offline learning independently at home.

According to (Oknish, N., & Suyoto, S., 2019) online learning has advantages including being able to grow and increase student learning independence. This opinion is in line with (Kuo et al., 2014) online learning is student centered so students will try to be responsible in learning. According to (Sobron, AN, & Bayu, R.2019) revealed that online learning can increase students' value. Based on this, it can be concluded that the advantages of online learning are that it can increase student independence, sense of responsibility, and value.

In this decade of the development of technology which is usually called the industrial revolution 4.0, innovation in the education sector must be more effective. The use of technology and information is very necessary for the manufacture of learning implementation tools (Sabaruddin et al., 2020). The learning model as an instrument of learning effectiveness must always be developed in accordance with the times. In the current era of technological development, the learning process should be carried out anywhere and in any situation. However, this is a challenge because teachers cannot directly supervise learning activities, therefore a learning model is needed that can overcome these challenges.

One type of new discovery in the physics learning model is the POE2WE learning model, namely Prediction, Observation, Explanation, Elaboration, Write, and Evaluation. The research team proposes the use of the POE2WE model as a reference for learning models in implementing effective online learning. The POE2WE model by taking into account the teaching strategies and principles of online learning that has been proposed by Bao will be used in several courses in the Physics Education Department, FKIP Siliwangi University. The main

online learning platform used is Google Classroom. In addition, the Learning Management System (LMS) will be supported by other Google apps for education. The purpose of this research is the growth of student character that needs to grow in the new normal era through a learning ecosystem based on the POE2WE model. The effectiveness of the POE2WE model in this study is seen from the character of students when online learning includes independent, communicative, collaborative, and self-regulated learning characters.

The POE2WE learning model can make students as subjects in learning. Students are active in finding a concept through direct observation or experimentation, not from memorizing material books or explanations from the teacher. This model allows students to be active in the learning process, provides opportunities for students to be able to construct their knowledge, communicate their thoughts and write down the results of their discussions so that students better master and understand concepts that will have an impact on increasing student learning achievements. The purpose this study is to analyse the student feedback on using the POE2WE learning model in supporting distance learning, to determine the effectiveness of the POE2WE learning model in the distance learning, and to find out the problems faced in implementing the POE2WE model in distance learning.

Problem Statements

The online learning environment that is developing rapidly along with advances in technology requires students to have several additional abilities in order to be able to adapt and compete in the world of work. In general, it is considered that the competence of students who learn online has decreased. The form of learning that can be used as a solution in the era of the industrial revolution 4.0 is distance learning. Distance learning is learning that uses an internet network with accessibility, connectivity, flexibility, and the ability to bring up various types of learning interactions. Distance learning is learning that is able to bring together students and educators to carry out interactions learning with the help of the internet. Distance learning is needed in learning in the era of the industrial revolution 4.0. Distance learning connects students with their learning resources (databases, experts/instructors, libraries) which are physically separate or even far apart but can communicate, interact or collaborate with each other (directly/synchronously and indirectly/asynchronously). Distance learning utilizes telecommunication and information technology, for example the internet.

On the other hand, the nature of learning science, namely products, processes, and scientific attitudes (Jumini, S., 2016) must still be embedded in the learning process regardless of the method, medium or under any circumstances. For this reason, POE2WE learning is carried out so that the nature of science learning can still be realized even though learning is carried out online with different situations and conditions for students because they study from their respective homes. POE2WE provides an illustration of how the inquiry learning process can be carried out in difficult times when learning cannot be done face to face. Students' interest in learning is maintained, and their independence is formed.

Novelty and Innovation

In essence, innovation in learning is needed. Innovation activities require strategies and skills that can increase the effectiveness of student learning, one of which is by using the right model, namely the use of the POE2WE model. The POE2WE model is a learning model developed to determine students' understanding of a concept with a constructivist approach (Nana, 2018) . This model can make students as subjects in learning. Students are active in discovering a concept through direct observation or experimentation. However, apart from using models in distance learning innovations, it certainly requires media that can facilitate distance learning activities. One of the media that can be used is LMS (Learning System Management) which is interactive and easy to use and can meet today's technological demands. The media is expected to facilitate students to study wherever and whenever and provide an

image that was previously abstract into a two- or three-dimensional virtual object into a real environment which is then raised and projected in real time. The learning steps using the POE2WE learning model is prsented in Table 1.

Table 1. Learning Steps Using the POE2WE Learning Model

Syntax	Convensional POE2WE	LMS-Asissted
Predictions	- Students make predictions about a problem in the form of pictures that are conveyed through student worksheets	- Students make predictions about a problem in the form of a YouTube video link that can be directly accessed via the LMS
Observations	- Students prove the predictions that have been made through simple experiments and group discussions to then fill in the student worksheets	- Students prove predictions that have been made through simple experiments with groups by utilizing discussion forums on the LMS
Explanation	- Students explain in front of the class related to the results of experiments carried out	- Students explain related to the results of experiments carried out by entering Google Meet with the link that is already available on the LMS
Elaboration	- Students make examples or apply concepts related to physics material in everyday life by writing them on student worksheets	- Students make examples or apply concepts related to physics material in everyday life by being able to directly include pictures or videos in the LMS
Write	- Students communicate in writing to write down the results of discussions and answers to questions contained in student worksheets	- Students communicate in writing to write down the results of the discussion on the LMS
Evaluation	- Students are evaluated in writing with the questions on the student worksheets	- Students are evaluated in writing with questions on the LMS with a certain deadline and the value can be obtained at the same time when the answers have been collected

Based on this description, this article is structured to describe the results of an analysis of student responses to the application of the LMS-assisted POE2WE learning model in supporting distance learning in the era of the industrial revolution 4.0.

METHODS

This study uses a quantitative descriptive study to analyse the student feedback on using the POE2WE learning model in supporting distance learning, to determine the effectiveness of the POE2WE learning model in the distance learning, and to find out the problems faced in implementing the POE2WE model in distance learning

Research Procedure

The research procedure used to analyze student responses to the POE2WE learning model in supporting distance learning in the industrial revolution 4.0 era uses the stages as seen in Figure 1.
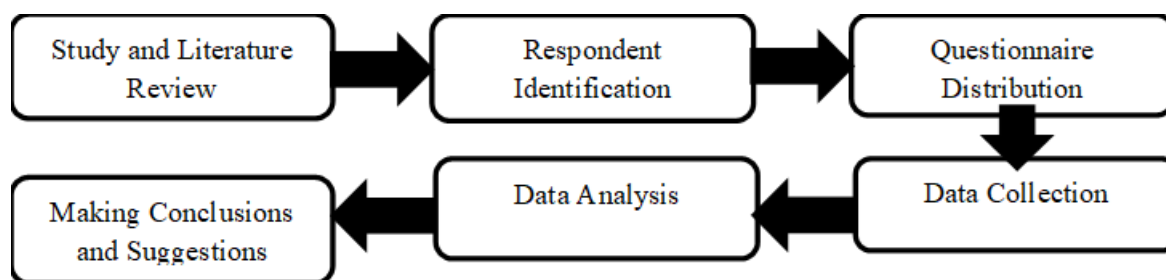
Figure 1. Research Procedures

At the literature study and literature review stage, the researcher conducted a literature study from several relevant literature studies, especiall those related to the application of the POE2WE model in learning activities. At the respondent identification stage, the respondents used in this study were students from two tertiary institutions from the study programs S1 Physics Education, D4 Nursing , and the Nurse Profession in Tasikmalaya City, although the samples were very different but in this case all three received Physics courses. Furthermore, at the questionnaire distribution stage, the researcher used the Google Form with a total of 15 validated questions (see Table 2). Then the data collection stage is the process of recapitalizing the data that is converted into an excel file. At the data analysis stage, the researcher used a Likert scale on the questionnaire and intended for respondents to indicate their level of agreement with a series of statements on the questionnaire. The last is the stage of making conclusions and suggestions, the researcher makes conclusions and suggestions from the research results that have been obtained.

Sampling

The population of this study were students from two tertiary institutions from the Physics Education S1 study program, and the D4 Nursing and Nurse Profession in Tasikmalaya City. The research sample was taken using a simple random sampling technique and 233 students from both study programs were involved. Student demgray is shown in Table 2.

Tabel 2. Student Demography

No	Aspects	Department		
		Physics Education	**Nurse**	**Nurse Profession**
1	Gender			
	Boys	12	85	46
	Girls	69	12	9
2	Ages (year)			
	> 18	78	92	55
	16 - 17	3	5	

Student Experience

Learning using the POE2WE model provides a different learning experience for students. This is because the syntax provided allows students to be able to learn independently and explore optimally. Table 3 shows the learning experiences experienced by students following the designed learning process.

Tabel 3. Students Experience

Syntax	Physics Students	Nurse Student	Surse Profesision
Predictions	- Students are not only able to predict problems in the form of images related to eyeglass materials but	- Students can not only predict images related to physics material that is closely related to health/medical	- Students can not only predict images related to physics material that is closely related to health/medical sciences

Syntax	Physics Students	Nurse Student	Surse Profesision
	also able to predict videos	sciences but also be able to predict a problem through a more tangible form, namely video	but also be able to predict a problem through a more tangible form, namely video
Observations	- Sudents are not only doing simple experiments directly with groups but utilizing technology, namely the discussion forums contained in the LMS	- Students are able to carry out experiments directly with groups even though they are blocked by distance because the LMS has been facilitated with a discussion forum for conducting experiments	- Students are able to carry out experiments directly with groups even though they are blocked by distance because the LMS has been facilitated with a discussion forum for conducting experiments
Explanation	- Students are not only making presentations in front of the class but are utilizing Google Meet with the link already available on the LMS which is usually done by one representative for each group	- Students are able to make presentations related to observation results through Google Meet with links available on LMS which are often presented by 1-2 groups with all group members participating	- Students are able to make presentations related to the results of observations through Google Meet with links available on the LMS which are often presented by all groups and then other groups respond in the form of questions, criticisms, and suggestions
Elaboration	- Students can not only make examples related to physics concepts but can also directly include pictures/videos as a complement	- Students become able to carry out the application of physics in medical science not only in the form of writing but also in the form of pictures/videos	- Students become able to carry out the application of physics in medical science not only in the form of writing but also in the form of pictures/videos
Write	- Students are not only able to write conclusions related to the results of the discussion but can also directly include pictures/videos as a complement	- Students are able to write related experiments, experimental results, and group discussion results	- Students are able to write down related experiments, experimental results, and group discussion results from each group that has an opinion
Evaluation	- Students carry out evaluations with a total of 30 multiple choice questions and students do not have to wait long to find out the evaluation results obtained because the scores appear at the same time after the answers are submitted	- Students carry out an evaluation with a total of 10 description questions and do not have to wait long to find out the evaluation results obtained because the scores appear at the same time after the answers are submitted	- Students Students carry out evaluations with a total of 15 description questions and don't have to wait long to find out the evaluation results obtained because the scores appear at the same time after the answers are submitted

Instruments and Instrument Quality

In this study the instrument used was a questionnaire at the level of student responses to the application of the POE2WE learning model in supporting distance learning in the era of industrial evolution 4.0. To measure respondents' answers, a likert scale was used which was divided into 5 scales (Strongly agree, agree, netral, disagree, strongly disagree). As for the validity test is done by calculating the correlation between each statement with a total score using the correlation technique formula "*product moment* ". Based on these calculations obtained 15 questions as seen in Table 4.

Tabel 4. The Instruments

No	Aspects	Indicator	Statement
1		Understanding after using the LMS with the POE2WE learning model	I understand the material better by using the POE2WE LMS Learning model
2	Understanding		By using the POE2WE LMS Learning Model, it can improve Physics learning outcomes
3		Interest after using the LMS with the POE2WE learning model	I am interested in following the next lesson using the POE2WE LMS model
4	Interest		I enjoy learning in class or at home using the POE2WE LMS model
5			I feel more enthusiastic about learning in class or at home using the POE2WE LMS model
6		Independence after using the LMS with the POE2WE learning model	By applying the LMS POE2WE model, I can increase my independence in completing the tasks given by the lecturer
7	Independence		I feel challenged in working on LMS on Prediction and Observation syntax
8			I better understand the material in the Explanation syntax followed by discussions between students and google meet with Lecturers and increase my courage.
9		Understanding after using the LMS with the POE2WE learning model	I understand the Elaboration syntax in the application of life and I further improve the application of knowledge in religious and social life
10	Understanding		I am in understanding the Write syntax challenged to conclude what I have learned and appear in myself to learn on time
11			In the evaluation of syntax, it requires me to have a broader insight into physics concepts and train to work on the correct concepts
12		Interest after using the LMS with the POE2WE learning model	The POE2WE LMS model can be used as a good learning resource
13	Interest		Can improve my learning creativity with the projects that are presented
14			Can be used as an online discussion center
15			I can use it as a medium for various Physics learning materials

Meanwhile, the reliability coefficient of the instrument was analyzed using Cronbach's alpha. From the calculation of the reliability of service quality instruments, it is obtained r_{count} = 0.977 and r_{Table} l for n = 20 with a significance level of 0.05 is 0.444. So, $r_{count} > r_{Table}$ so that the research instrument is reliable.

Data Collection and Analysis Techniques

After data collection was carried out, what was done was data analysis using descriptive analysis by finding the average student response for each statement. The average results are then represented by intervals. The range (interval) that will be used as a basis is presented in Table 5.

Table 5. Criteria for student feedback on using LMS-assisted POE2WE learning model to facilitate digital learning in society 4.0

Score	Classification
>4.20	very good
> 3.40 - 4.20	Well
a > 2.60 – 3.40	Pretty good
>1.80 – 2.60	not good
≤ 1.80	not good

The data is then followed by IRT analysis to determine student response tendencies. IRT analysis is also used to explain student response trends for each item and aspect assessed. Follow-up analysis is continued by conducting inferential analysis to review the tendency of responses given by students. The inferential test carried out is non-parametric which is based on the prerequisite test in which the results of the normality test indicate that the data is not normally distributed with a sig value less than 0.00, and the homogeneity test also shows that the data is not homogeneous. Therefore, the inferential test was performed using the Mann Whitney differential test for analysis by gender and Kruskal-Wallis for analysis by department.

RESULTS AND DISCUSSION

Student feedback

In this study, an experiment was conducted to investigate the effect of various types of written feedback in computer-based learning assessments on student responses. Students were randomly assigned to fill out a questionnaire. The POE2WE learning syntax which is carried out through the learning management system directs students to construct knowledge through observation. The validation of the observations is done by educators when students make presentations. So that POE2WE learning is considered effective. Table 6 is the result of the statement of the effectiveness of the POE2WE learning model in supporting distance learning in the era of the industrial revolution 4.0.

Table 6. The results of student feedback on using LMS-assisted POE2WE learning model to facilitate digital learning in society 4.0

No	Statement	Evaluation				
		SA(5)	A(4)	Dis. A(3)	D'n. A(2)	natural resources (1)
1	I understand the material better by using the POE2WE LMS Learning model	34 (14.6%)	157 (67.4%)	38 (16.3%)	4 (1.7%)	0 (0 %)
2	By using the POE2WE LMS Learning Model, it can improve Physics learning outcomes	40 (17.2%)	161 (69.1%)	29 (12.4%)	3 1.3%	0 (0%)
3	I am interested in following the next lesson using the POE2WE LMS model	28 (12%)	150 (64.4%)	52 (22.3%)	2 (0.9%)	1 (0.4%)
4	I enjoy learning in class or at home using the POE2WE LMS model	34 (14.6%)	159 (68.2%)	39 (16.7%)	1 (0.4%)	0 (0%)

No	Statement	Evaluation				
		SA(5)	A(4)	Dis. A(3)	D'n. A(2)	natural resources (1)
5	I feel more enthusiastic about learning in class or at home using the POE2WE LMS model	31 (13.3%)	141 (60.5%)	58 (24.9%)	2 (0.9%)	1 (0.4%)
6	By applying the LMS POE2WE model, I can increase my independence in completing the tasks given by the lecturer	60 (25.8%)	156 (67%)	15 (6.4%)	2 (0.9%)	0 (0%)
7	I feel challenged in working on LMS on Prediction and Observation syntax	57 (24.5%)	157 (67.4%)	17 (7.3%)	2 (0.9%)	0 (0%)
8	I better understand the material in the Explanation syntax followed by discussions between students and google meet with Lecturers and increase my courage.	41 (17.6%)	159 (68.2%)	32 (13.7%)	1 (0.4%)	0 (0%)
9	I understand the Elaboration syntax in the application of life and I further improve the application of knowledge in religious and social life	49 (21%)	171 (73.4%)	12 (5.2%)	1 (0.4%)	0 (0%)
10	I am in understanding the Write syntax challenged to conclude what I have learned and appear in myself to learn on time	48 (20.6%)	172 (73.8%)	13 (5.6%)	0 (0%)	0 (0%)
11	In the evaluation of syntax, it requires me to have a broader insight into physics concepts and train to work on the correct concepts	58 (24.9%)	161 (69.1%)	13 (5.6%)	1 (0.4%)	0 (0%)
12	The POE2WE LMS model can be used as a good learning resource	45 (19.3%)	168 (72.1%)	16 (6.9%)	3 (1.3%)	1 (0.4%)
13	Can improve my learning creativity with the projects that are presented	42 (18%)	172 (73.8%)	18 (7.7%)	1 (0.4%)	0 (0%)
14	Can be used as an online discussion center	45 (19.3%)	153 (65.7%)	33 (14.2%)	2 (0.9%)	0 (0%)
15	I can use it as a medium for various Physics learning materials	49 (21%)	164 (70.4%)	19 (8.2%)	1 (0.4%)	0 (0%)

From Table 6, it can be seen that all of the question items have the largest answer weight in the agree category. This shows that POE2WE learning has a positive impact on online learning compared to ordinary online learning. Thus, students have the opportunity to get the right concepts and know the benefits of their learning outcomes, even though learning is done online. Table 7 is the average result of the questionnaire student feedback on using LMS-assisted POE2WE learning model to facilitate digital learning in society 4.0.

Table 7. The average results of student feedback on using LMS-assisted POE2WE learning model to facilitate digital learning in society 4.0

No	Statement	Raw Score	Logit	Teta Score
1	I understand the material better by using the POE2WE LMS Learning model	3.95	2.11	63.07
2	By using the POE2WE LMS Learning Model, it can improve Physics learning outcomes	4.02	1.17	60.26
3	I am interested in following the next lesson using the POE2WE LMS model	3.87	1.03	58.29

No	Statement	Raw Score	Logit	Teta Score
4	I enjoy learning in class or at home using the POE2WE LMS model	3.97	1.07	62.29
5	I feel more enthusiastic about learning in class or at home using the POE2WE LMS model	3.86	0.86	59.56
6	By applying the LMS POE2WE model, I can increase my independence in completing the tasks given by the lecturer	4,18	0.48	56.90
7	I feel challenged in working on LMS on Prediction and Observation syntax	4,15	0.91	59.13
8	I better understand the material in the Explanation syntax followed by discussions between students and google meet with Lecturers and increase my courage.	4.03	0.80	56.30
9	I understand the Elaboration syntax in the application of life and I further improve the application of knowledge in religious and social life	4,15	0.83	58.46
10	I am in understanding the Write syntax challenged to conclude what I have learned and appear in myself to learn on time	4,15	0.45	54.53
11	In the evaluation of syntax, it requires me to have a broader insight into physics concepts and train to work on the correct concepts	4,18	1.67	61.44
12	The POE2WE LMS model can be used as a good learning resource	4.09	1.19	61.20
13	Can improve my learning creativity with the projects that are presented	4.09	0.15	51.41
14	Can be used as an online discussion center	4.03	0.60	56.67
15	I can use it as a medium for various Physics learning materials	4,12	0.83	57.47

Based on Table 7, the average value of POE2WE learning statisfaction is 4.01. This value when consulted on the standard assessment Table 5 is included in the effective category. The effectiveness of POE2WE learning in supporting distance learning in the 4.0 revolution era can be explained as follows.

Based on the questionnaire that was given to 233 students, the average score of students' understanding of the material on learning was 3.95., in the well category. POE2WE learning with LMS 64.7% of students gave an agreed response that can improve understanding of the lesson. In the learning steps students are required to find their own concepts, then the Student Worksheet guides them to be able to do learning systematically.

The average score of student responses to the increase in physics learning outcomes is 4.02., in the effective category. 69.1% of students agree that with POE2WE learning, student learning outcomes increase. This is in line with an increase in understanding of the concepts being studied so that students can work on evaluation questions as well so that their learning outcomes increase.

The average score of student responses in the interest of participating in further learning is 3.87., in the effective category. POE2WE learning has provided a good stimulus for students in carrying out learning activities. In the first step, Prediction gives students the opportunity to freely express their opinions, so that students feel valued and are fully involved in learning. Observation activities invite students to prove the correctness of their predictions, and can elaborate well. Students can learn the benefits of science in real life, so that their interest in learning increases.

The average score of student responses to the pleasure of learning is 3.97. While the average score of student responses to a sense of enthusiasm for learning is 3.86. Both are in the effective category. 68.2% of respondents agree that learning with LMS POE2WE is fun. In the

midst of a pandemic, students feel bored with online learning and the lack of guidance from lecturers, the presence of the POE2WE learning model provides a new nuance in distance learning. Students feel guided and directed coupled with student worksheets, making students happier. The process of working in groups and presentations increases student activity, so students feel happier in learning. The involvement and activeness of students in the learning process makes them more enthusiastic.

The average student response to increasing independence in completing assignments is 4.18. The average score of student responses to understanding the material in the Explanation syntax is 4.03. The average score of student responses to understanding Elaboration syntax is 4.15. All three are in the effective category. 67% agree and 26% strongly agree that PO2WE learning increases learning independence. The stages in the POE2WE learning process require students not only to know but to really understand the concepts being studied. Bills in the process of explanation, elaboration and evaluation provide students with experience to study seriously in order to be able to explain (explanation) well. A good understanding provides students with the provision to be able to work on evaluation questions and can provide the best solutions to problems that occur in society, so that elaboration can be carried out by students with the correct understanding of concepts. The stages of the learning process like this can ultimately train students' independence.

The average score of student responses to being challenged is 4.15., and the average student response to understanding Write syntax is 4.15. Both are in the effective category. As many as 73% of respondents agree and 20% strongly agree that POE2WE learning provides its own challenges in the learning process. The obligation to work in groups in carrying out practicums, presentations and doing evaluations as well as evaluating, training and providing their own experiences so that students feel challenged to learn more than usual. The prediction stage at the beginning of learning gives students the opportunity to express their opinions, and prove the truth of their answers in the practicum process also challenges students to take learning seriously.

The average score of student responses to the understanding of Evaluation syntax is 4.18., in the effective category. A total of 69.1% agree and 25% strongly agree that the evaluation carried out in the POE2WE learning process provides skills and experience, as well as broader insight in Physics concepts and trains to work on the correct concepts. Evaluation in the POE2WE learning process is not only done conventionally, paper and pencil tests, but is also carried out in every learning process on affective and psychomotor aspects. When students make observations in practicum groups, students also evaluate the predictions given at the beginning of learning. In this process the students' abilities and competencies are also being assessed/evaluated by the lecturers. When students are elaborating, students are also confirming and evaluating the concepts they understand independently, so that they have a correct understanding of the concepts being studied. When students do explanations and presentations, the validation process is being carried out on the truth of the concepts obtained and their understanding. Thus the evaluation process is carried out at every stage and is truly felt by students.

The average student response to increasing learning creativity is 4.09., in the effective category. A total of 74% agree, and 18% strongly agree that learning POE2WE can increase student creativity. Assignments and projects as well as problems presented through student worksheets provide a stimulus for students to think outside the usual way to answer and do assignments so that their creativity is honed. Competence in conducting practicum in group work also trains students' creative abilities.

The average score of student responses to using LMS as a learning resource is 4.09, and the average score of student responses to being able to use an online discussion center is 4.03., and student responses to being able to use it as a medium for various learning materials that is

equal to 4.12. All three are in the affective category. The POE2WE-based Learning Management System (LMS) integrated with Google Meet provides a solution for students who are bored in doing distance learning. The lack of lecturer guidance in online learning can be overcome with the POE2WE learning model. Thus this learning can be an statisfaction distance learning resource and medium.

The results of the analysis based on a questionnaire that has been given to 233 students, the results obtained an average of 4.01. This means that from the 15 questions in the questionnaire, it can be said that the average student agrees with each question in the questionnaire related to the Effectiveness of the POE2WE Model in Supporting Distance Learning in the Industrial Revolution Era 4.0. So it can be said that the POE2WE Learning Model has been well to supporting distance learning in the era of the industrial revolution 4.0.

The effectiveness of the POE2WE learning model in the distance learning

Tabel 8. Test Statistics based on Department

	Score_New
Chi-Square	1.155
df	2
Asymp. Sig.	.561
a. Kruskal Wallis Test	
b. Grouping Variable: Dept	

Based on the Table 8, there is no significant difference in response in the three classes tested. This is an indication that the implementation of learning with the POE2WE model can be implemented in various learning backgrounds.

Tabel 9. Test Statistics based on Gender

	Score_New
Mann-Whitney U	2408.500
Wilcoxon W	2904.500
Z	-2.076
Asymp. Sig. (2-tailed)	.038
a. Grouping Variable: Gender	

Based on the Table 9, there are significant differences in responses to learning responses based on gender. Further analysis showed that the response of female students was better than that of male students. Visually this can be seen in the Figure 2.
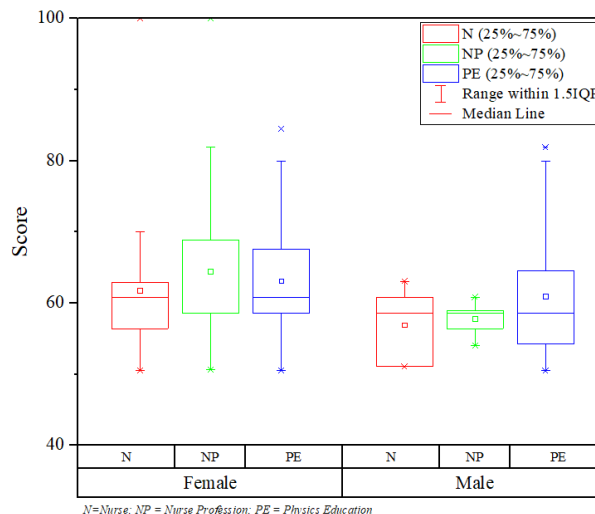

Figure 2. Respon Summary

The problems faced in implementing the POE2WE model in distance learning

The problem encountered in implementing the POE2WE model over long distances via LMS is that students feel that using LMS online makes their expenses increase because they have to buy additional quota and often students find it difficult to signal or internet network, but students have tried to find wifi or a place with a good internet signal or network. This is based on the results of observations of researchers during one semester learning activities.

CONCLUSION

The results of the analysis based on the numbers given to 233 students obtained a result of 4.06. Then there is no significant difference between the responses of students in terms of gender so that it can be said that students agree with each statement in the questionnaire regarding the application of the LMS-assisted POE2WE learning model in distance learning in the era of the industrial revolution 4.0. This shows that distance learning with the POE2WE model gets a positive response from students. The distance learning process using this model, among other things, makes students better understand learning material, is interested in learning activities, and trains students' courage. The problems found are related to the increasing use of quotas and internet networks that are less supportive but can be resolved.

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