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Proceedings of the Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2019)

It is such a great pleasure to welcome all the participants to the Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH) 2019. It is the first international conference which is organized by Universitas Tarumanagara in the field of social science and humanities. The goal of this conference is to provide a forum that facilitates the exchange of knowledge and experience of both practitioners and academics in the fields of the applications of social sciences and humanities.

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Dear our Distinguished guests, ladies and gentlemen,

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As we all know, the goal of this conference is to provide a forum that facilitates the exchange of knowledge and experience of both practitioners and academics in the fields of the applications of social sciences and humanities. Under these circumstances, they can mutually share their findings. Besides, the topic itself, which is about the Implementation of Research Results on Social Sciences and Humanities in Urban Ecology for People's Prosperity, is extremely interesting. I can agree with the conference committee that a little thing has been done to provide comprehensive understanding of the importance of social sciences and humanities to support people's prosperity.

I would like to take this opportunity to extend my appreciation to the following institutions. Firstly, this year's conference becomes special due to the support from our Plenary Speakers: Dr. Svann Langguth, Head of Science and Technology Division of Embassy of the Federal Republic of Germany Jakarta, Prof. Dr. rer. pol. habil. Wilhelm Steingrube from Universitaet Greifswald, Germany, and Dr. Linda Lin, Kun Shan University, Taiwan. We are thankful for your wonderful cooperation. Secondly, our gratitude goes to our main sponsor the DAAD and also Tarzan Photo for the utmost support and kind contribution.

I would also sincerely say thanks to the organizing committee for their commitment, hard work and dedication, making this internationally reputable conference successfully realizable.

Finally, I would like to express my gratitude for the presence of distinguished speakers, authors, reviewers, and a number of active participants from several countries. I wish you all a wonderful and great conference. Thank you. It is such a great pleasure for me to welcome all the participants to the Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH) 2019. It is the first international conference which is organized by Universitas Tarumanagara in the field of social science and humanities whose proceedings will be indexed by Scopus. With the success of this first TICASH, I hope this event would be held annually. I am very thankful that TICASH 2019 is supported by the DAAD (German Academic Exchange Service) with funds from the Federal Foreign Office, Federal Republic of Germany. As we all know, the goal of this conference is to provide a forum that facilitates the exchange of knowledge and experience of both practitioners and academics in the fields of the applications of social sciences and humanities. Under these circumstances, they can mutually share their findings. Besides, the topic itself, which is about the Implementation of Research Results on Social Sciences and Humanities in Urban Ecology for People's Prosperity, is extremely interesting. I can agree with the conference committee that a little thing has been done to provide comprehensive understanding of the importance of social sciences and humanities to support people's prosperity. I would like to take this opportunity to extend my appreciation to the following institutions. Firstly, this year's conference becomes special due to the support from our Plenary Speakers: Dr. Svann Langguth, Head of Science and Technology Division of Embassy of the Federal Republic of Germany Jakarta, Prof. Dr. rer. pol. habil. Wilhelm Steingrube from Universitaet Greifswald, Germany, and Dr. Linda Lin, Kun Shan University, Taiwan. We are thankful for your wonderful cooperation. Secondly, our gratitude goes to our main sponsor the DAAD and also Tarzan Photo for the utmost support and kind contribution. I would also sincerely say thanks to the organizing committee for their commitment, hard work and dedication, making this internationally reputable conference successfully realizable. Finally, I would like to express my gratitude for the presence of distinguished speakers, authors, reviewers, and a number of active participants from several countries. I wish you all a wonderful and great conference. Thank you.

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Atas perhatian dan kerjasamanya kami ucapkan terima kasih.

Hormat kami,

Dr. Hugeng S.T., M.T. (SMIEEE)

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Development of Moodle Learning Management System-Based E-Learning Media in Physics Learning

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Abstract— **This study is about the development of online learning media or e-learning, which is based on the Moodle Learning Management System (LMS) in physics learning. This study aims at investigating the feasibility, practicality, and effectiveness of e-learning within the learning process. The development model used in this study was the ADDIE model consisting of Analyze, Design, Development, Implementation, and Evaluation. The trial subjects in this study were 13 students of Physics Education Department of Universitas Papua who enrolled in Physics 101 during the second semester of the 2018-2019 academic year. The appropriateness of e-learning media was obtained through the feedback sheet filled by seven validators, which consisted of learning media experts and practitioners, whereas, effectiveness and practicality of the e-learning media were obtained through students' responses following the learning process. This study reveals that the developed learning media is within appropriate categories in all its aspects, such as layout, navigation aspect, function aspect, and pedagogical aspect. The students' responses on the utilization of this e-learning media turn out to be effective and practical in each aspect of the assessment. Therefore, Moodle LMS based e- learning media is appropriate to be utilized in physics learning.**

Keywords: e-learning, Moodle, physics learning, ADDIE

I. INTRODUCTION

The rapid advancement of technology in industrial revolution 4.0 significantly influences the education world. Educational institutions who were not able to keep up with this development, especially the implementation of technology withinthe learningprocess, will be left out in the competition [1]. Utilization of technology media in educational institutions, especially universities, would be able to increase the quality of its institutions due to effective implementation of technology in speed up the process and access, and reducing conventional administration process [2]; [3]; [4]. This development of technology greatly helps the education process, especially in its implementation during the learning process [5]; [6]. Utilization of information technology and communication in learning at least has three important roles for the content of the learning as learning media and as learning tools [7]. Technology advancement has enabled new ways of teaching and learning, such as online learning where learners use their personal computer during the learning process [8]. Utilization of computer in learning process enables students to explore and to gain information from extensive resources.

One of the utilization of information and communication technology in learning is through online learning using e-learning media. E-learning is a learning activity that utilizes electronic devices. E- learning implementation plays a significant role in the transformation process of learning into digital learning, both the system and the content of learning [9]; [10]. Various learning model can be implemented through e-learning media. E- learning media is more effective in helping the learning process, for either the teacher or the learners [11]. E-learning can provide better learning outcome due to learning facilities that are available for learners anytime and anywhere [12]. Learners can access the topics and materials in e-learning anywhere anytime.

One of the e-learning media that can be utilized to manage the teaching and learning activity is the Moodle Learning Management System (LMS) [13]. This Moodle LMS-based e-learning is an open source application that can be downloaded from the Moodle official website, moodle.org. In order to access this application online, this Moodle needs to be installed into a web hosting, which usually registered or bought for certain active period. In addition to using web hosting, there are also various Moodle service providers that can be directly used, both for free and paid services. There are several advantages of this Moodle online system, such as setting an automatic learning schedule, thus the material provided by the teacher will be easily obtained and learned [14]. Utilization of Moodle as e-learning media is very appropriate, especially in higher education as it is supported with various features that support the

implementation of online lecture/learning. Moodle is the best e-learning platform [15]. The variety of features within the e- learning, such as availability of reading resources, worksheets, online exercise facility, and discussion forum facility as means for lecture and students online interaction are necessary, especially for higher education students as they are meant to be creative and comprehend their understanding on their topics [16]. Moodle e- learning is equipped with various facilities to support online learning, hence, enable students to learn independently and is expected to increase their thinking skills.

Utilization of e-learning, especially in higher education, is very important to increase students' interaction with lecturer. The availability of unlimited learning resources and resources that made it possible for students and lecturer to share with more advance higher education institution will, in turn, improve the quality of higher education and its output. Currently, the learning process in several universities in Papua is yet to implement e-learning effectively due to their limited resources. Their website servers are often inactive, thus, e-learning is yet to be implemented. Therefore, an e-learning facility that can be accessed anytime and from anywhere needs to be developed.

II. METHODS

This is a development study with ADDIE development model. ADDIE is a research and development model which comprised of Analyze, Design, Development, Implementation, and Evaluation. Within the analyze stage, several performances and needs analysis that encompassed the initial student's ability analysis and material coverage that would be developed were performed. In the design stage, e-learning media design, which comprised of media selection and development of format and storyboard were carried out.

Meanwhile, in the development stage, the development of learning media and feasibility test by the validators were carried out. Further, in the implementation stage, the e-learning implementation trial in learning was carried out. Finally, in the evaluation stage, the evaluation of students' responses to the implemented learning was performed. ADDIE has an advantage due to its complete stages and constant revision, thus, the output learning media would be effective and optimum [17]. The test subject in this study were students of Physics department of Faculty of Education and Teaching Sciences, Universitas Papua, who enrolled in physics 101 with the total of 13 students in the second semester of the 2018-2019 academic year. Assessment of the e-learning media involved seven validators from media experts and material experts from Universitas Negeri Yogyakarta and practitioners from Universitas Papua. The developed learning media was assessed from the layout, navigation, function, pedagogic aspects [18]; [19]; [20]. Feasibility analysis to assess the content feasibility of the developed e-learning media was Aiken's V formula [21]; [22].

$$V = \Sigma s / (n (c - 1)) \qquad (1)$$

V refers to the agreement index of the validator on the appropriateness of the item, s refers to the score given by the validator deducted with the lowest assessment score, while n represents the number of the validator, and c is the number of categories that can be selected by validator [23]. Effectiveness and practicality assessments of the developed e-learning media were obtained from the students' responses following the learning process. The questionnaires were distributed based on the statements as presented in Table 1 [24].

The technique of data analysis used to analyze students' responses was Rasch modeling. This modeling was carried out using Winstep application. This Rasch modeling created a more accurate analysis and so far is yet to be surpassed by other techniques of analysis [25]. Rasch modeling is more effective to describe students' responses in the questionnaire.

Table 1: Effectiveness and Practicality Assessments of the developed E-learning Media.

Assessment	Statement	Code
Effectiveness	a. Utilization of e-learning media can increase students' spirit to study	P1+
	b. The e-learning media can assist in obtaining information regarding the currently studied physics topic	P2+
	c. The e-learning stimulates curiosity	P3+
	d. E-learning media can create independent learning	P4+
	e. E-learning media can help develop analytical thinking skill	P5+
	f. E-learning media can help develop evaluation skill	P6+
	g. E-learning media can help develop creative skill	P7+
Practicality	a. E-learning is complicated//difficult to use	P8-
	b. Combination of background and front ground screen of e-learning media is appropriate	P9+
	c. *Hyperlink* among files within the e-learning media can be easily accessed	P10+
	d. Pictures, illustration, graphics or video within e-learning media draw learners interest	P11+
	e. Materials in e-media learning are presented in sequence	P12+
	f. Texts within the e-media can be easily read	P13+

III. RESULTS AND DISCUSSION

The first stage in this study is the analysis stage. This stage covers a performance analysis and a need analysis. In performance analysis, the ability, motivation and students' performance were analyzed. Meanwhile, in need analysis, materials coverage and learning strategies were analyzed. Current observation in the Department of

Physics Education of Universitas Papua revealed that students' ability and learning motivation were varied. There are students with high learning motivation; however, the majority have low learning motivation and ability. These different learning abilities are due to their different basic ability when they were in high school. If the background of the students is further analyzed, there are students from the natural science department, social science, and those who enroll in Physics Department from vocational schools which were taught only a bit of physics topics. This different background ability is very important to direct and to facilitate them in learning [26]. Utilization of Moodle-based e-learning media is one of the appropriate learning media to facilitate students in learning as it has a variety of functions and contents [27].

The topics coverage presented in e- learning media were basic physics topic on electrical circuits. The topic covers themes such as the electric battery, the strength of a current within a circuit, the resistance of a resistor circuit, the degree of electricity power, resistor circuit and capacitor circuit, an electromotive force (EMF), the Principles of Kirchoff law, and the magnitudes in RC circuits. The electric circuit topic is an abstract physics topic. Such an abstract topic is usually difficult for students to directly understand through lecturing method without any learning media [28]. Description of abstract physics topic is more appropriately described using information communication technology learning, to simulate abstract materials, thus, easier to understand [29]; [30]. The curriculum used in the Department of Physics of Universitas Papua is suitable with the national curriculum standard for higher education, which based on learning achievement.

Next, on the design stage, the prototype for learning, which consisted of a selection of media and its format, initial design, and creation of storyboard. In this stage, Moodle LMS-based learning media was design. The design of e-learning consisted of registering the web-server hosting of the e-learning to enable online access. The next step was to create content and the initial e-learning features, setting the user accessibility. Course feature in Moodle LSM-based e-learning consisted of two types of features, weekly model feature and materials topic feature [31]. Implementation of e- learning for basic physics of physics 101 used material topic feature. In each topic material, virtual experiments learning are presented. Through virtual experiments on e- learning, students can directly simulate materials that they learn online [32]. The facility to upload their assignments is also provided in each topic materials; hence, students can submit their assignments directly and find out their grades The developed product in this study is Moodle LMS-based e-learning media. The developed e-learning consists of initial feature, main page, and course page as shown in Figure 1(a) and Figure 1(b). For a user with no user name and password, the direct sign up can be directly made through clicking the new user sign up feature. Further, the lecturer can sign up students who have been enrolled in a subject to this e-learning media.

(a)

(b)

Figure 1: The developed e-learning (a) Initial feature before login (b) The main page feature after login.

Students who have enrolled in this online class can attend the course online using various facilities provided in e-learning. The available facilities consist of topic materials, learning media, discussion forum, assignment space and test that can be accessed online anywhere anytime. The features of the e-learning are presented in Figure 2(a) and Figure 2 (b).

Moodle-based e-learning media can also be operated through mobile Moodle application that can be downloaded and played in android smartphone. The access easiness of Moodle LMS-based e-learning, either through phone or computer can motivate students to learn. Learning habit needs to be trained to students for long life learning. Utilization of e-learning media is one of the appropriate solutions to train students' discipline and learn to study and discover a currently learned concept [33]. Utilization of ITC media, e-learning, students are also trained to work and utilize current technology that has penetrated all aspects of their lives [34]. Utilization of e-learning can also create students' learning habit as learning is not only in class but also from anywhere and anytime.

(a)

(b)

Figure 2: The features of the e-learning (a) Materials in each meeting topic (b) Virtual experiment facility that can be operated through e-learning.

Next, on the development stage, the Moodle LMS-based e-learning was developed. The media were then validated and revised based on the input from the experts and revision following the trial. The steps in this development stages were validation and feasibility test. The validation was to test whether the developed media have met the validity criteria based on the assessment of the validators and practitioners. The limited trial was to test the practicality and effectiveness of the developed media. There was seven (7) validator in this study, experts' validators from Universitas Negeri Yogyakarta and practitioners' validators from Universitas Papua. Feasibility test involved experts' validators on learning media, physics learning experts, and evaluation experts on physics learning

The validation result was that the developed learning media gained a V Aiken value of more than 0.76 (based on Aiken table value for seven validators of 4 assessment scale). This result showed that all statements were appropriate for each assessment aspect, layout, navigation, function and pedagogy as shown in Table 2. The recommendation from the validators on the developed e-learning media was on the presentation of learning material and students' worksheet that contain physics symbols that should be adjusted its writings, such as italic writing and utilization of type of letter and utilization of appropriate physics symbols for the strength of the current with ampere unit. Activate online forum discussion, thus, students can directly interact with their lecturer. Clearly write the time to accomplish the task in each presented topic materials. These suggestions from the validator are then taken into consideration by revising the developed e-learning media to be appropriate for students' online learning

Table 2: Feasibility analysis of the e-learning media.

No.	Aspect	Statement	V	Category
1.	Layout aspect	a. Layout of the content in e-learning is proportional	0,95	Feasible
		b. The feature of e-learning is interesting	0,86	Feasible
		c. Suitability of background with the content utilization	0,86	Feasible
2.	Navigation aspect	a. Directory and category are clear for the user	0,81	Feasible
		b. Simple/consistent utilization of content in each feature	0,81	Feasible
		c. Utilization of text in e-learning can be clearly read	0,81	Feasible
		d. Automation of features within e-learning	0,81	Feasible
3.	Function aspect	a. Easy adaptation with e-learning interface	0,81	Feasible
		b. E-learning resources can be well accessed/functioned correctly	0,81	Feasible
		c. Easy to search for information	0,81	Feasible
4	Pedagogy Aspect	a. Clarity of the function and users tasks (lecturer and student) in e-learning	0,81	Feasible
		b. Clear learning strategy in e-learning	0,86	Feasible
		c. Effective means of feedback	0,81	Feasible
		d. E-learning media can increase students' creativity to learn	0,86	Feasible
		e. Facilities in e-learning develop students HOTS ability	0,86	Feasible

In this stage, e-learning media was implemented on students who enroll in basics physics subject in the department of physics of Universitas Papua. The learning online learning consisted of four main themes on electrical circuits. The topic covers the electric battery, the current

strength of a circuit, the resistance of a resistor circuit, the extent of electric power, resistor circuit and capacitor circuits, an electromotive force (EMF), the principle of Kirchoff law, and the magnitudes in RC circuits. Students learn online through e-learning by utilizing the learning facilities provided, which consists of learning materials, learning media (virtual experiments), interactive assignments, and discussion facility through the discussion forum

Students' active participation is evident in online learning, where they actively discuss within the discussion forum and submit their online assignments. Students' active participation is also evident from the log activity, where they often log in to access the e-learning. Utilization of e-learning ease students to learn as it can be accessed anywhere anytime. Students are encouraged to participate actively in learning. In e-learning, the lecturer is no longer the only source of learning, students can gain various sources of materials by utilizing the digital searching feature, either through the facility provided in e-learning or free online search on the internet [35].

The final stage in this study was evaluation. This stage was to analyze students' responses on the e- learning, to find out the effectiveness and practicality of the developed e-learning media. The

effectiveness and practicality assessment was carried out following the implementation of the developed online e-learning media. The analysis of students' responses using Rasch modeling through Winstep application is shown in the following Figure 3.
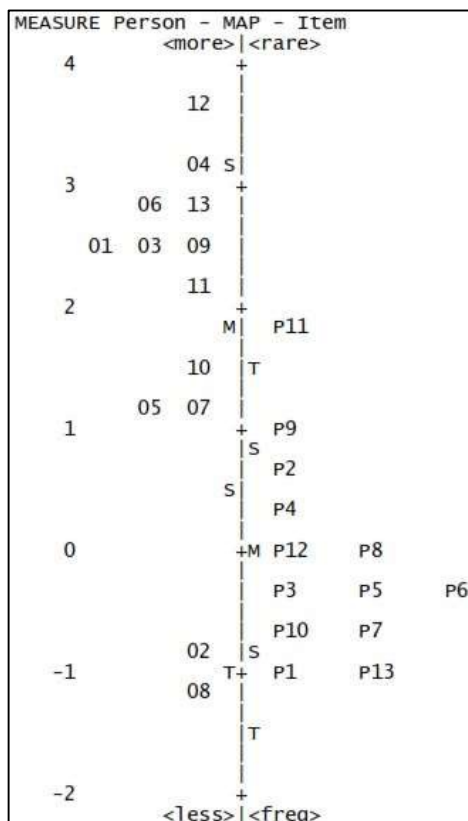

Figure 3. Students' responses on e-learning utilization.

The students' responses show that the person measure is +1.81 and is larger than 0.00. This points out that the average students' responses in the questionnaire are largely agree. On Figure 3, it is shown that on the right side there are eight students (12, 04, 06, 13, 01, 03, 09, and 11) with high accessibility level. These eight students provided high responses in each statement within the questionnaire. On the bottom right side, there is only one student (08) who gave low responses on each statement. Further analysis, showed that this one student activity was less active in an online learning activity; therefore, extra attention from the lecturer needed to guide this student.

On the right-hand side in Figure 3, it shows that statement P11 is the hardest to be agreed by the students on picture feature, illustration, graphics or video within the e-learning media. The next statement that students' found difficult to agree is statement number P9 on the suitability of the foreground and background picture in e-learning media. These statements (P9 and P11) were difficult for students to agree on as the e- learning media was design using the default template provided by Moodle. Thus, layout and features adjustment are needed for each presented course. The lecturer needs to adjust the layout of the online learning with the Moodle template; hence, the readability of the content would be better. In general, students agree with the e-learning media. Students appear to utilize the Moodle-based e-learning media actively. The utilization of e-learning media has an impact on the students' attitude, where they tend to learn and discover the concepts independently [36]. Learners consider that by using e-learning media, they will have more time to compare conventional learning, as they can access the learning materials anywhere anytime [37]. Utilization of e-learning media encourages and motivates students to learn. These learning habits draw students' interest and provide good responses on the utilization of e-learning.

IV. CONCLUSIONS

This study shows that the developed e-learning media is within the appropriate category based on the validators' assessment on each assessed aspect, such as layout, navigation aspect, function aspect, and pedagogic aspect.

Effectiveness and practicality assessment of the developed e-learning media are based on the students' responses. Students' responses following the tryout of using this developed e-learning media were that it is effective and practice in each assessment aspect. Therefore, this Moodle LMS-based e-learning media can be implemented in physics learning

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PARALLEL SESSION SCHEDULE
Thursday, 27 June, 2019

Room : Conference Room 6
Time : 13.00 – 15.10 WIB
Track : Art, Science, and Humanity

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.10	Learning Pancasila through Snakes and Ladders Game	Kurnia Setiawan, Ninawati Lihardja & Meiske Yunithree Suparman	Universitas Tarumanagara
2	13.10-13.20	Chinese Indonesian Cultural Orientation Analysis	Ninawati Ninawati, Kurnia Setiawan &Meiske Yunithree Suparman	Universitas Tarumanagara
3	13.20-13.30	Museum Display techniques in order to Meet Visitor satisfaction based on the case study Museum Pusaka	Sherly Jocelyn, & Ulli Aulia Ruki	Bina Nusantara
4	13.30-13.40	Program Evaluation Of Continuing Professional Development at Teacher Working Group	Zainuddin Zainuddin, Suryadi Suryadi & Nurhattati Fuad	Universitas Negeri Jakarta
5	13.40-13.50	The Secret to Enhance Innovativeness in Digital Industry	Ardi Ardi	Universitas Pelita Harapan
6	13.50-14.00	Development of Moodle Learning Management System (LMS)-based E-learning Media in Physics Learning	Irfan Yusuf, Sri Wahyu Widyaningsih, Zuhdan Kun Prasetyo & Edi Istiyono	Universitas Papua
7.	14.00-14.10	The Model of Harmonization of Multiculturalism Society at Magelang Regency	Tri Purwani, Indah Arvianti &Tri Karyanti	AKI
8.	14.10-14.20	Moral Leadership and Job satisfaction: The Mediating Effects of Interpersonal and Informational Justice	Nikodemus Hans Setiadi Wijaya, Wisnu Prajogo & Heni Kusumawati	STIE YKPN

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