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To cite this article: Z Abidin *et al* 2020 *J. Phys.: Conf. Ser.* **1567** 032029

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Elena as a learning management system for supporting blended learning: Do students perceive Elena as useful?

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Abstract. The rapid development of technology in the fourth industrial revolution era has a significant role as a catalyst in developing, changing, and innovating in the field of education. Technology support for learning activities has become a necessity. Learning is not only performed face-to-face but can also be combined with online learning. The combination is called blended learning. Universitas Negeri Semarang (UNNES) as a higher education institution plays a role in creating a conducive academic environment so that the students' learning process is effective and meaningful. UNNES developed Elena to facilitate blended learning. This study aims to explore students' perceptions in their use of Elena as a learning support tool. Questionnaires consisted of 27 Likert-scale items were administered to students. A number of 435 students participated in this study. The results revealed that students perceived that the use of Elena to support their learning activities. The result of the study revealed that students perceived the usefulness of Elena to conduct different learning activities. The students also perceived that Elena as a learning management system had fulfilled their expectations.

1. Introduction

In the fourth industrial era, higher education institutions are demanded to be able to produce the quality of human resources, improve science and technology, and create innovation to support the nation's competitiveness. The tri dharma paradigm of higher education must also be aligned with current technological advances, one of which is that the implementation of online learning activities that focus on skills development [1]. The technology used to support learning activities has become a necessity. Nowadays, face-to-face classroom activities can be combined with online learning. Such a combination of learning through face-to-face and online meetings is called blended learning [2]. In this regard, lecturers are no longer the only learning resource for students. Lecturer takes a role as a facilitator. Students can seek any information to update their knowledge independently by utilizing existing technology. Students are responsible for their own learning process. In education 4.0, such learning is termed as personalized learning where students control the pace of their own learning and the instructional practices undertaken by lecturers is adjusted to what students need [2].

UNNES as a higher education institution plays a role in creating a conducive academic environment so that student learning processes are effective and meaningful. As a tertiary institution, UNNES has a great responsibility to prepare a generation of skilled and competent learners with 21st-century skills,



known as 4C, namely critical thinking and problem solving, creative thinking and innovation, communication, and collaboration [3]. As a commitment to preparing human resources with three new literacies namely digital, technology and human literacy, UNNES encourages the integration of character education in each course, and also provides full support for technology integration, one of which is the implementation of policies on the implementation of blended learning model using learning management system (LMS) named Elena. UNNES's new policy on implementing the blended learning model encourages the optimization of the use of Elena to support learning activities. This study aims to explore students' views in the use of Elena as an LMS for blended learning.

2. Elena, A Moodle-Based Learning Management System

Elena is Moodle-based e-learning developed by UNNES to support academic activities (UNNES, 2016). Moodle is an open-source learning management system for online learning. The MOODLE acronym comes from the Modular Object-Oriented Dynamic Learning Environment [4]. Moodle has become a term for its synonym with a software package designed to help educators create quality online learning. The design of Moodle is developed based on collaborative learning where an educator can create a student-centred environment that helps students to build their own knowledge [5]. Elena as an LMS enables educators to create a learning environment where the students can access learning resources at any time and anywhere without space, time, or distance limits [6]. Elena provides features to add multimedia content, assignments, and support interactions, including group discussions, conversation sessions, online queries, and exams. Elena is a metamorphosis of ILMO, e-learning developed by UNNES in 2009.

3. The Context of the Study and Method

The study presented in this paper is part of a larger study which investigated user's behaviour in the use of Elena at UNNES. A questionnaire survey was employed for data collection technique. The survey was conducted online using Google Form in two months (August – September 2019). A total of 435 students participated in this study. The demographic information of respondents summarises in Table 1.

Table 1. The demographic characteristics of the sample

	Frequency	Percentage
<i>Gender</i>		
Male	156	35.9
Female	279	64.1
Total	435	100.0
<i>Education level</i>		
Undergraduate	365	83.7
Master	65	14.9
Doctoral	6	1.4
Total	435	100.0
<i>Technology skills level</i>		
Level 1 : Basic	146	33.6
Level 2 : Intermediate	187	43.0
Level 3 : Advanced	78	17.9
Level 4 : Expert	24	5.5
Total	435	100.0

The majority of participants who engaged in this study were from undergraduate level ($N = 364$) and they were dominated by female students ($N = 279$). Most of the participants had an intermediate technology skill level ($N = 187$). It indicates that the students enable to use of the required functional and technical knowledge and skills in accomplishing their jobs. These students also have the capability to choose appropriate apps or technologies for completing tasks, enable to do an experiment with new

apps or technologies and new developing process. The technology skills level was measured using indicators that have been developed by Microsoft [7]. The questionnaire consisted of 27 Likert-scale items have been analysed. The validity and reliability of the Likert scale used in the study were conducted. The reliability of the scale (Cronbach's $\alpha = 0.966$) can be considered as acceptable [8]. Meanwhile, Cronbach's α for each subscale (Performance Expectancy, Effort Expectancy, Facilitation Conditions, Hedonic Motivation, Learning Value, Habit, Information Quality, Technical System Quality, Behavioural Intention, and Elena Use Behaviour) exceeded 0.7, thus indicating an acceptable degree of internal consistency in each subscale. Furthermore, to gauging of sampling adequacy, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity (BTS) were calculated. The analysis of the scale resulted that the KMO = 0.957 and BTS < 0.01. It indicated that sampling adequacy was satisfied [9]. A number of 27 Likert-scale items were used after several items were cut off due to small factor loading value (less than 0.4) [9].

4. Results and Discussion

This section extrapolates on the distribution of the item scores for only three subscales differentiated by students' information technology (IT) skills, namely performance expectancy, learning value, and technical system quality.

4.1. Performance expectancy

Performance expectancy (PE) is related to individual believes about the usefulness of technology to carry out different activities [10-12]. With regard to performance expectancy factor, there are two items adapted from Venkatesh et al. [10] that have been used in this study, which are I find Elena useful for my study (PE1); Elena allows me to accomplish class activities more quickly (PE2); Elena increases my learning productivity (PE3). PE2 item was dropped from the instrument due to its factor loading value less than 0.4 [9].

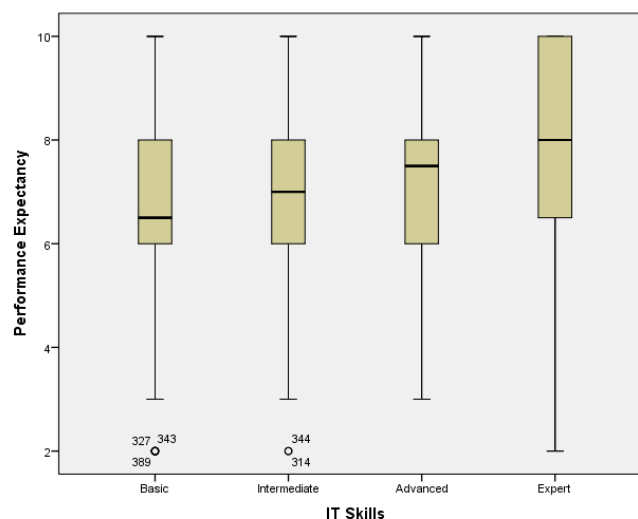


Figure 1. Item scores for performance expectancy by IT skills

The responses of PE1 and PE2 were added together to generate a PE subscale score ranging from 2 to 10. The composite score was dichotomized using mean (which was 6) as a cut-off value. This means that for PE subscale, scores above cut-off value indicate a high PE and scores below the cut-off value show low PE. Figure 1 depicts the box plot of PE subscale. The medians of PE scores for students with different IT skills are above the cut-off, thereby indicating that all students demonstrate a high level of performance expectancy. In this respect, students believe about the usefulness of Elena to conduct different activities to support their learning process.

4.2. Learning value

Learning value (LV) refers to the relationship of learning, time and effort that has an impact on the intention to use Elena [13]. Students' viewpoints that the time and effort in learning process represents the perception of positive learning value. The learning value impacts on the intention of students to use Elena. In this study LV scale items were adapted from Ain et al. [13], namely: learning through Elena is worth more than the time and effort given to it (LV1); in less time, Elena allows me to quickly and easily share my knowledge with others (LV2); Elena gives me the opportunity to decide about the pace of my own learning (LV3).

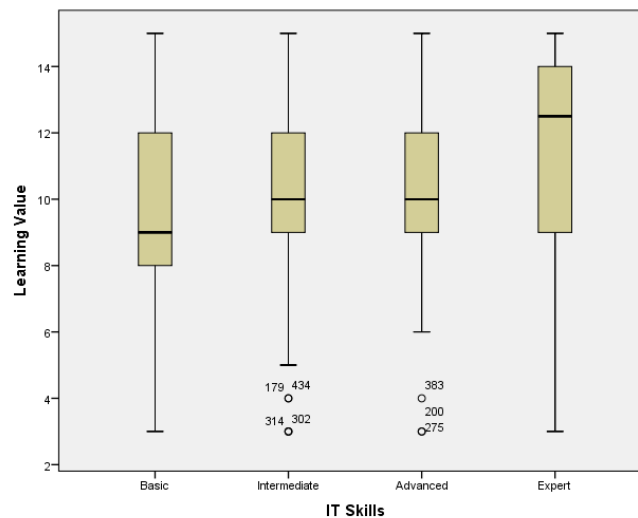


Figure 2. Item scores for learning value by IT skills

The responses of LV1, LV2, and LV3 were added up to make an LV subscale score ranging from 3 to 15. The composite score was dichotomized using mean (which was nine) as a cut-off value. In this regards that for LV subscale, scores above cut-off value indicate a positive LV and scores below the cut-off value show negative LV. Figure 2 presents the box plot of LV subscale. From the figure 2, the medians of LV scores for students with intermediate, advanced, and expert IT skills are above the cut-off, thereby indicating that the students with these skills show positive of learning value. Meanwhile, the median of LV score for students with basic IT skills is nine, in which 50 percent of these students scoring 9+ and only 25 percent of them scoring below the cut-off. This result indicates that half of the students with basic IT level hold positive learning value towards Elena use. Having a positive learning value indicates that students feel that learning through Elena is worth more than the time and effort that is devoted to using it for different activities. Moreover, students perceive the ease of sharing their knowledge with their peers and enable them to manage the pace of their own learning.

4.3. Technical system quality

The technical system quality (TSQ) refers to a system that is easy to be used and to be learned, enables the user to effectively accomplish tasks, and allows them to become more productive [14-15]. In this study TSQ scale items were adapted from Fruhling and Lee [14], namely: The Elena's interface was pleasant (TSQ1), Elena has all the functions and capabilities I expect it to have (TSQ2); I liked using the interface of Elena (TSQ3).

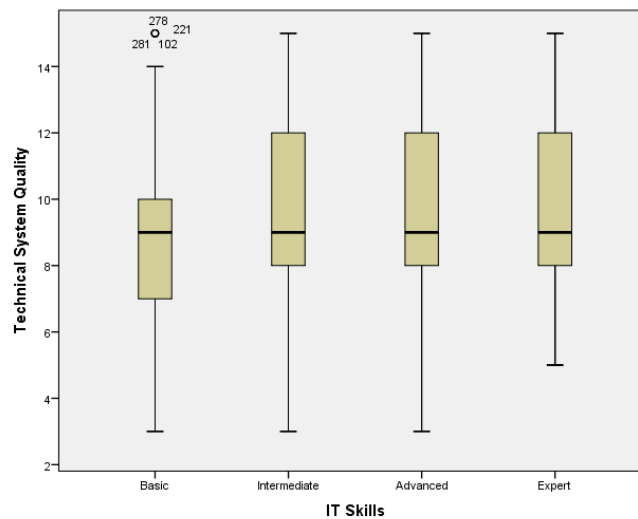


Figure 3. Item scores for technical system quality by IT skills

The responses of TSQ1, TSQ2, and TSQ3 were added together to generate a TSQ subscale score ranging from 3 to 15. The composite score was dichotomized using mean (which was nine) as a cut-off value. In this regards that for TSQ subscale, scores above cut-off value indicate a high TSQ and scores below the cut-off value show low TSQ. Figure 3 shows the box plot of TSQ subscale. From figure 3, the medians of TSQ scores for students with all levels of IT skills are nine, thereby indicating that the students perceive that Elena has a high quality of the technical system. Elena's interface and its functions and capabilities to be used by the students are met with students' expectations.

5. Conclusion and Limitations

Students in the current study exhibited their positive beliefs about the use of Elena to support their learning activities. The result of the study revealed that students perceived the usefulness of Elena to conduct different learning activities and allowed them to control their own learning pace. In the context of the usability of Elena, the students perceived that Elena as a learning management system had fulfilled their expectations.

This study is not without limitations. This study only outlined three subscales out of ten subscales that have been observed. The generalizability of the study is also limited to the students who use Elena; attention is not given to those students who did not engage with Elena during their study.

Acknowledgement

The research reported in this paper was supported by DIPA UNNES grant with contract number: SP DIPA-042.01.2.400899/2019.

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