

Usability of Moodle question types by EFL teachers

Abdul Syahid

abdul.syahid@iain-palangkaraya.ac.id

*Department of English Language Education, Faculty of Teacher Training and
Education, Institut Agama Islam Negeri Palangka Raya, Indonesia
Jalan G. Obos Kompleks Islamic Center, Palangka-Raya 73112, Indonesia*

Abstract

The obvious fact that not all features of a software computer is used has driven the researcher to examine the usability of question types in the quiz activity module of Moodle. To examine which question types were perceived useful, easy to use and learn along with satisfying and the dimensions that made them probably adopted in day-to-day teaching learning process, 30 teachers of English as a foreign language having no previous Moodle experiences assessed 23 question types question using the Usefulness, Satisfaction, and Ease of Use questionnaire. The participants showed agreements on the dimensions of usefulness, ease of use and learning, along with satisfaction of 10 types in which Random Short-Answer Matching, Multiple Choice, OU Multiple Response, and True/False were most highly rated. Findings also suggest that the agreement levels of usefulness and ease of use were comparatively higher than that of the other dimensions. The adoption of Moodle question types in the classrooms could be motivated by their usefulness and ease of use. This study may help explore the fundamental needs of the teachers when administering online tests in the Moodle-based e-assessment.

Keywords: usability; question types; Moodle quiz activity module; teachers of English as a foreign language

INTRODUCTION

In the arena of, but not limited to, the teaching of English as a foreign language (EFL), the Information Communication Technology, language pedagogy, and second language acquisition theories have had a long and happy marriage. In 1960s they birthed Computer Assisted Language Learning/CALL (Healey, 2016). After run as computer applications and/or from CD/DVD-ROMs in personal or networked computers, nowadays CALL can be saved in everyone's pocket and accessed 24/7 in the form of web CALL (Thomas, Reinders, & Warschauer, 2013). Today's CALL has been beautified by highly improved multimedia, enhanced by Web 2.0 tools of communication and collaboration (Cowie & Sakui, 2013), and empowered by highly improved global internet access up to 35.41 Mbps for download and 16.11 Mbps for upload (Ookla, 2018). In addition, all types of computers such as tablet computers have been more affordable (Government of Canada, 2018) whereas the computing performance has been continually improved ("20 Years of Computing," 2018). It is

therefore unsurprising that the web CALL has been widely brought in TEFL classrooms.

In the TEFL classrooms, many teachers have set up virtual classes to supplement or enrich the face-face-to instructions by using a learning management system (LMS). LMS can be defined as a computer program developed to create instructional contents, communicate with teachers and learners, asses the learning activities, and administer the teaching learning process (Piña, 2010). One of the biggest global LMS is Moodle (Modular Object-Oriented Dynamic Learning Environment). Its market share was 67% in Latin America, 57% in each Europe and Oceania, and 25% in US/Canada as reported by MindWires (2017). Originally developed by Martin Dougiamas in 1999 (Al-Ajlan, 2012), Moodle has been installed in over 92 thousand sites by over 150 million users in 230 countries ("Moodle.org: Moodle Statistics," 2019). Favored because of such functionalities as being low (not to say free) cost along with having both strong socio-constructivist pedagogical and free-open-source technological foundations (Al-Ajlan, 2012), Moodle has also been widely adopted in the arena of language teaching, including TEFL.

In the field of TEFL, there has been growing interest in adopting Moodle. Moodle was employed, for example, by Bataineh and Mayyas (2017) who supplemented their Reading and Grammar classes at a Jordanian university with online instructional materials. In teaching punctuation in an EFL writing class with over 100 Turkish students, Bakla (2019) integrated his own animated cartoons in Moodle. To improve their EFL students' reading comprehension, Tsai and Talley (2014) also included reading strategy training in a Moodle system. Much work on the integration of Moodle has been carried out in other EFL areas such as listening, e.g. Gobel and Kano (2014). Even since the first half of the last decade, based on his reviewing its features, Brandl (2005) has considered Moodle the best course management an EFL teacher could dream of as revealed in details by Hillar (2010) and Stanford (2009).

As previously mentioned, Moodle can be used for many educational purposes by EFL teachers. One of the Moodle activity modules used for the assessment purposes is the quiz module in which a set of questions can be developed (Badia, Martín, & Gómez, 2018; Stanford, 2009, pp. 415–6). In a free Moodle hosting service, <https://www.gnomio.com/>, there are 23 built-in question types and 1 item for a descriptive purpose. Some types need more advanced settings to operate than others (Coy, 2013). All of the types but the essay one can be automatically marked and fed back according to the way a quiz creator set them up. A question can be created in the question bank first and added to the quiz or directly in the quiz. Each question needs to be set up on its own. (For a more complete procedure to administer a quiz in Moodle, please see Coy (2013))

After creating questions, a quiz creator needs to adjust the quiz setting. For example, to set when the quiz is open and closed along with whether the time limit is enabled. Other settings are concerned with grading, layout, question behavior, review options, appearance, extra restrictions on attempts, overall feedback, common module

settings, access restrict, activity completion, tags, and competencies. In terms of quiz security, for instance, by setting up question behavior, a quiz creator can make up each question and its options, if any, randomly shuffled anytime a student have the quiz. The quiz is then ready, steady, go online.

The online quiz offers many advantages for different stakeholders. In their reviewing a considerable amount of literature on the advantages of online test, Alruwais, Wills, & Wald (2018) found that such a kind of test is advantageous to all of the educational domains, i.e. student, teacher, institution, and educational aims. For students, the electronic test offers more control, flexibility, game-like friendly interface, fast and ease of use, and immediate feedback which result in students' improved achievements and motivation (pp. 34–5). For teachers, the online test saves their time, facilitates them to increase the feedback quality and to track the students' performance, ease the learning analyses, and solve such problems in assessing large number of students as physical and mental fatigues (p. 35).

In the institutional level, the fast and accurate assessment method, time and cost-savings, security, and academic integrity are the benefits the online test can offer (p. 35). Significantly, the features in the Moodle quiz activity module enable the questions sorted which a paper-based test cannot manage so that the test can be displayed in simple and fast ways. The test results of an online test are more accurate than those of a paper-based test. An adaptive test can be more easily set on the basis on the students' answers. Such advantages make the educational aims can be achieved (p. 36) in the Moodle quiz activity module.

As a complete learning management system, however, Moodle seems to offer too many features to use by teachers in their day-to-day teaching learning activities. Teacher would use the features only relevant to their teaching learning tasks at hand. Not all of the quiz activity modules is used. Such a phenomenon suggests that the features are waiting for the teachers' exploration. How the features of a computer application are not completely used is reported by The Standish Group International, Inc. (2010, p. 15) finding that only 20% of features in even tailor-made software are often, 30% are rarely, and half of the features are hardly ever or never used.

This study is therefore motivated to assess which question types in the Moodle activity modules will be potentially used by EFL teachers. Some studies presented a big portrait of Moodle activity modules only. Two recent studies, for instance, have been carried out on the Moodle activities as whole. Badia et al. (2018) investigated 132 Spanish secondary school teachers' use of Moodle activities. They found that the quiz activity module belonged to the most frequently used activities. This confirms previous findings that 30 Finnish university lecturers considered the quiz module one of the very essential and heavily used modules (KC, 2017).

Despite the apparently clear importance of quiz activity module, it has gained little attention. Moreover, less attention has been paid to the Moodle question types. Luckily, Borromeo (2013), one of the few researcher taking such an interest, studied

which Moodle question types some Philippine university teachers liked to use. The participants in the study were shown Moodle 8 standard question types. After wards, they were asked to decide which type of questions were used and would be used. In the EFL context, such attention is comparatively harder to find.

Such a lack of information about the use of more specific features of a Moodle activity module, in this case the question types in the quiz module, could therefore be the driver of this study. Taking into account the available studies and literature, the first research questions raised in this study was what question types in the Moodle quiz module were perceived useful, easy to use and learn along with satisfying. The second one was what the dimensions were that motivated the EFL teachers to adopt the question types in the day-to-day EFL classrooms.

To answer the research questions, this study is framed on the basis of usefulness, usability, learnability, and satisfaction dimensions as set in the Usefulness, Satisfaction, and Ease of use questionnaire (USE) by Lund (2001), one of the latest and frequently used instruments for the purpose. Knowing which question types were most potentially taken by EFL teachers and dimensions that drive them to write the types could contribute towards a more complete vision of EFL-specific Moodle usage. Such a vision might help EFL teachers, e-learning administrators and developers along with the educational institutions using Learning Management Systems.

METHOD

Participants

Participants in this study were 19 female and 11 male EFL teachers of 11 institutions, joining a 3-day Moodle EFL teacher training. With their ages ranging from 22 to 52 years ($M = 33.6$, $SD = 7.4$) and teaching length ranging from 1 to 25 years ($M = 7.37$, $SD = 5.69$), they taught EFL at kindergartens (13.3%), elementary schools (16.7%), junior (26.7%) and senior (33.3%) high schools along with universities (10%) in the district of East Kotawaringin, Central Kalimantan, Indonesia. The majority of participants had a bachelor's degree (87.6%) while the rest had a master's one (13.36%). All of them majored in English language teaching. They had no previous experiences in using Moodle or other LMS.

In a 3-day Moodle teacher training, the participants set up their own Moodle website using a free Moodle hosting website, i.e. <https://www.gnomio.com/>. One of the training sessions was on how to administer an online test. In the session, the quiz activity module was introduced. All of the participants were tutored in creating 2 questions for all of the 23 question types in the quiz module. Each teacher-made online tests then had 46 items.

Instrument

As noted previously, the questionnaire, i.e. USE, was adopted from Lund (2001). Used to measure each participant's opinion of the usefulness (8 items), ease of use (11 items), ease of learning (4 items), and satisfaction (7 items), USE contains a 7-point numeric response scale ranging from 0 (not available or N/A), 1 (*strongly disagree*) through 4 (*neither agree nor disagree/neutral*) to 7 (*strongly agree*). Whereas the possible range of score for the questionnaire as a whole is 0 to 150, that of usefulness, ease of use, ease of learning dimensions is 0 to 56, 77, 28, and 49, respectively.

USE was selected as the main instrument in this study for two main reasons. Firstly, USE is still one of the latest and frequently used instrument developed to measure usability aspects (Perlman, 2018). Furthermore, recent studies have reported that USE had high validity and reliability (Dantas et al., 2017; Gao, Kortum, & Oswald, 2018). The obvious evidence indicates that USE could reasonably be used to evaluate the self-perceived usability of question types in the Moodle quiz activity module.

In this study, the 30 items of USE questionnaire had very high reliability, Cronbach's $\alpha = .99$. Similarly, separate analyses for the 8 items of Usefulness, 11 items of Ease of Use, 4 items of Ease of Learning subscales showed very high reliability, Cronbach's $\alpha = .99$. In this view, the USE questionnaire has reliably reflected the construct to measure.

Procedure

After creating 2 items of each question type in the training, the participants were asked to anonymously fill in an online questionnaire in a Moodle course named Training for Teachers of English as a Foreign Language on Using Moodle in <https://syahid.gnomio.com/>. When the questionnaire was being filled out, on the spot the Indonesian translation was orally delivered to make sure that each item was clear for the participants. They had a maximum of 10 minutes to complete 30 items of online USE. In line with the number of question types, the number of questionnaires to fill in was also 23 ones as partly shown by Figure 1.

All dimensions were viewed from their perspectives as EFL teachers. Then, results of the 23 USE questionnaires with 900 items were compared. The higher score a certain question type had, the more positively perceived the question type was in terms of usefulness, usability, learnability, and satisfaction. It also means the question type will be more possibly used by the participants in their EFL classrooms. The score of each dimension could also tell which dimensions were the factors influencing the teachers to use the questions types. After the data were submitted to IBM SPSS Statistics Version 22 (IBM Corp, 2013), the means of each question types and dimensions were automatically arranged in descending order. IBM SPSS Statistics Version 22 (IBM Corp, 2013) supported the data analysis.

	Strongly agree	Agree	Slightly Agree	Neither Agree Nor Disagree	Slightly disagree	Disagree	Strongly disagree	N/A
It helps me be more effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It helps me be more productive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It gives me more control over the activities in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It makes the things I want to accomplish easier to get done.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It saves me time when I use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It meets my needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It does everything I would expect it to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question Types	Sum	<i>M</i>	<i>SD</i>
Embedded Answers (Cloze)	3,359	3.73	1.67
Essay	3,169	3.52	1.74
Combined	2,827	3.14	1.31
Drag And Drop Markers	2,347	2.61	1.42
Numerical	2,333	2.59	1.50
Variable Numeric	1,818	2.02	1.01
Variable Numeric Set With Units	1,793	1.99	.97
Variable Numeric Set	1,789	1.99	.98
Calculated Multi-choice	1,485	1.65	1.04
Calculated Simple	1,480	1.64	1.05
Calculated	1,464	1.63	1.05

Those whose usefulness, ease of use and learning, and satisfaction were negatively perceived were 13 ones. The participants' levels of agreement were between 0 (*not available*) and 4 (*agree nor disagree/neutral*). Unsurprisingly, the 7 mathematics-related question types were at the bottom.

Driving Dimensions

To answer the second research question, the dimensions driving a certain question type positively perceived by the participants are worth noting. Table 2 shows how each dimension separately contributed to whether question were perceived useful, easy to use and learn, along with satisfying. It also reveals the maximum and minimum score of each dimension.

Table 2. Usability Dimensions

Question Types	Dimension			
	Usefulness	Ease of Use	Ease of Learning	Satisfaction
	(<i>n</i> = 240)	(<i>n</i> = 330)	(<i>n</i> = 120)	(<i>n</i> = 210)
Random short-answer matching	6.75	6.81	6.96	6.54
Multiple choice	6.75	6.81	6.96	6.32
OU multiple response	6.72	6.68	6.96	6.32
True/False	5.69	6.17	6.51	6.54
Select missing words	5.68	6.17	6.46	5.40
Short answer	5.68	6.17	6.46	5.40
Matching	5.68	6.17	6.46	4.61
Ordering	5.55	2.95	6.96	6.32
Kprime(ETH)	5.53	4.80	4.94	4.44
Drag and drop onto image	5.20	3.20	3.94	4.37
Drag and drop into text	5.55	3.19	2.94	3.36

Question Types	Dimension			
	Usefulness	Ease of Use	Ease of Learning	Satisfaction
	(<i>n</i> = 240)	(<i>n</i> = 330)	(<i>n</i> = 120)	(<i>n</i> = 210)
Pattern match	5.53	3.20	2.94	3.36
Embedded answers (Cloze)	5.53	2.95	2.94	3.36
Essay	5.53	2.95	2.94	2.45
Combined	4.84	2.75	2.11	2.40
Drag and drop markers	3.71	2.20	1.94	2.37
Numerical	1.26	2.95	2.94	3.36
Variable numeric	2.21	1.85	1.94	2.11
Variable numeric set with units	2.21	1.86	1.94	1.97
Variable numeric set	2.21	1.85	1.94	1.97
Calculated multi-choice	1.19	1.58	1.94	2.11
Calculated simple	1.26	1.55	1.94	2.06
Calculated	1.19	1.55	1.94	2.06
<i>M</i>	4.41	3.75	4.04	3.88

The 10 positively perceived question types in the previous table had some agreement levels between 4 (*neutral*) to 7 (*strongly agree*) except the Ordering's ease of use and the Drag and Drop onto Image's ease of use and that of learning.

It can also be highlighted that not all of the usefulness, ease of use and learning, and satisfaction dimensions of the bottom 7 question types were negatively perceived. Further analysis showed that of the 13 negatively perceived question types, the participants replied that the usefulness of Drag and Drop into Text, Pattern Match, Embedded Answers (Cloze), Essay, and Combined were positively perceived with a range from 4.84 to 5.55.

DISCUSSION

As reported above, in response to the first research question, the data suggest that less than half (43.5%) of the 23 question types in the Moodle free hosting service were positively perceived to be useful, easy to use and learn along with satisfying. The participants showed relatively a full agreement to 4 question types, a moderate one to 3 question types, and a small one to 3 question types. The perceived usefulness, usability, learnability, and satisfaction for the rest of question types ranged from 1.63 (slightly less than *strongly agree*) to 3.83 (almost *neutral*).

Viewed from what The Standish Group International, Inc. (2010) found, if the agreement levels could be interpreted as the possibility of a certain question used by EFL teachers, the top 7 question types (30%) rated over 5 (*slightly agree*) may be "frequently" used in their classrooms. The 3 ones (13%) rated at least 4 (*neutral*) may "sometimes or infrequently" be given to their students. Moreover, the rest of the

question types (57%) rated below 4 (from *not available* to below *neutral*) might be “hardly ever or never used”. It could reasonably be stated that, compared to the 20:30:50 in the usability of general computer application (The Standish Group International, Inc., 2010), in this study the Moodle quiz activity module has provided fairly higher usability level of question types to adopt in terms of EFL-related usefulness, ease of learn and use along with satisfaction.

The 4 highly, 3 moderately, 3 fairly agreed question types in this study correlate fairly well with Borromeo (2013, p. 3). She found that the university teachers were developing Moodle-based online quizzes with short answer, single and multiple answer multiple, numerical, and true or false. They planned to use matching and embedded answers/ cloze question types. Such a similarity is not surprising since single and multiple answer multiple choice question types have evidently been extensively used in off- and online tests and so has short answer questions.

Even though the results share a number of similarities, notice must be taken to numerical question type. The participants were using the numerical question types in Borromeo’s (2013), but perceived negatively in this study. Such difference could be explained by the fact that in the previous study, some participants taught Mathematics for Multimedia (p. 2) because the study was not specifically aimed at English language teaching. They were not introduced to as many question types as in this study and not asked to develop items by themselves either. They were just given a description about the question type and a picture of a sample question.

Seen in this way, this study might portray more accurately how some Moodle question types were favored by teachers. The teachers’ experience of directly working with all of the Moodle-provided question types and each of the perceived of usefulness, ease of use and learn along with satisfaction could shed light more clearly on the usability of question types not only entirely but also separately. As this study is attempting to understand a more specific Moodle feature in a more specific field of study, i.e. EFL teaching, the findings could lead to a greater understanding in preparing EFL teachers for transition from paper to electronic assessments.

The transition from paper- to electronic assessment is certainly challenging for EFL teachers. In practice, it requires intensive teacher training because, as Alruwais (2018) underlined, some teachers are inexperienced with e-assessment. Only well-trained teachers that could serve effective technology-enriched assessment purposes. In Moodle-based virtual learning, the online quiz was one of the activities most widely used by both teachers (Badia et al., 2018) and learners (Goh, Hong, & Gunawan, 2013). A teacher training specifically on administering online test would have far-reaching benefits.

Related to the second research questions, as might be expected, the bottom 7 mathematics-related question types had the lowest mean scores of the 4 dimensions. In other words, the participants indicated their relatively convincing level of disagreement to such numeric-related questions in all of the dimensions. Only the satisfaction of

Numerical reached over the level of Slightly Disagree. Such level made Numerical the most highly rated numeric-related one but, as a whole, still not positively perceived as useful, easy to use and learn, along with satisfying.

Additionally, it is apparent from Table 2 that the participants had a tendency to view the 23 question types from the standpoints of usefulness and ease of learning. The average scores of the two dimensions were relatively higher than 4 (*neutral*) but did not reach 5 (*slightly agree*). That all of the question types were easy to use and satisfying were just almost neutrally perceived by the participants. In other words, they showed a slightly disagreement to the ease of learning and satisfaction offered in Moodle question types as a whole.

It could also be noted that 4 out of 8 usefulness subscale were the most highly rated of the 23 items in the questionnaire. The first 2 items having the same average score ($N = 690$, $M = .16$) were related to how a certain question type made an assessment task easier to get done ($SD = .94$) and could meet their assessment needs ($SD = .93$). The next 2 items were about time-saving ($SD = .92$) and effectiveness ($SD = .91$) also having the same mean score, $M = .15$. Such pragmatic opinions of the Moodle question types therefore could drive the participants' classroom adoption.

The pragmatic opinions were reflected in the participants' question types of choice. That random short answers matching was the most favorite question type ($M = 6.75$) could be explained by its dimension of ease of learning ($M = 6.96$). In Figure 2 showing a random short answers matching item created by a participant, its appearance is very similar to the matching type items in which the items are randomly developed from a group of at least two short answer items previously created. More details on its ease of learning can be found in Myrick (2010, pp. 92–94).

By only clicking at least 2 previously-created short answer items, a random short answers matching one is ready. It is not unsurprising because that the basic tasks were the easiest one for the participants to learn and remember (Lund, 2001). The single and multiple response multiple choice types gained the same high level of perceived ease of learning and relatively similar high levels of perceived usefulness and ease of use. As the three question types were among the most frequently used question types in EFL classrooms including and its high ranked usability dimension, the future use of the three question types in EFL instructions could be predicted.

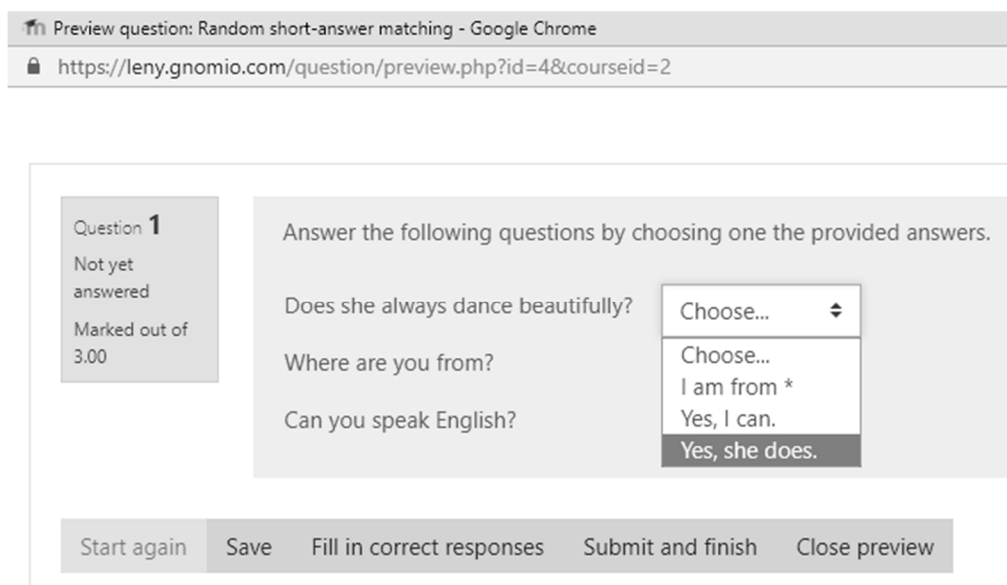


Figure 1. Screen Shot of a Random Short Answers Matching Item by a Participant

CONCLUSION

The findings of this study indicate that the Moodle question types could be used in EFL assessments even though only 10 out of 23 built-in question types were perceived as useful, easy to use and learn, along with satisfying. As a whole, the highest dimension was usefulness followed by ease of use, satisfaction, and ease of learning. Partially, the perceived ease of learning for the top 10 types was the highest followed by perceived usefulness, ease of use, and satisfaction. The 3 question types rated above *agree* were driven by perceived ease of learning, ease of use, usefulness and satisfaction. Taken together, these results would seem to suggest that even for a complete novice of Moodle the built-in questions types were ready to be used in EFL classroom in which the EFL-specific types were considered very positive. These findings add to some understanding of the EFL teachers' relatively unheard voice of experiencing technology-enhanced assessments.

This study paid more attention on describing quantitatively usability description of Moodle question types. The picture is therefore still not clear. Further collection of qualitative data would be needed to understand better how the participants responded to each specific features of the 23 question types. The quantitative analysis of usability could also be followed by factor analyses. Digging deeper into how usability each dimension is related could the relationship among. Nevertheless, this study has gone some way towards increasing the understanding of how EFL teachers having no previous Moodle experience interacted with one of its sub-module. The way this study approached a certain sub-activity module could be applied to other sub-modules so the Moodle features are well explored for EFL purposes.

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AUTHOR'S CV

Abdul Syahid has been an EFL teacher since 1995. After teaching at some senior high schools and universities in Sampit, he joined the Department of English Language Education, Faculty of Teacher Training and Education, Institut Agama Islam Negeri Palangka Raya in 2018 to pursue his teaching career. Besides second language writing, his areas of interest include Computer Assisted Language Learning.