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Usability of E-Assessment Media Web-based "Census" to Support the Learning Assessment during Covid-19 Pandemic

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Abstract

CENSUS web-based e-assessment media was developed to support online learning assessment activities during the Covid-19 pandemic that can be suit according to the needs of teachers and students in Indonesia. The usability test of the CENSUS web -based e-assessment media was carried out using the System Usability Scale because it tends to be easy to use and cost-effective in order to collect subjective ratings from users . Based on the results of the study, it is known that the usability of the e-assessment media CENCUS web-based is included in the good category, although it still requires improvement, both of terms of developing e-assessment media so that it can be better accepted by users and the development of usability measurement tools that combine user performance so that the results of the analysis become more comprehensive.

Keywords: *Usability; System Usability Scale; E-Assessment; Learning Process; Web-based*

Introduction

Digitalization has been integrated into various human activities in daily life. The rapid growing of digital native era is no exception affecting the education. Especially government policies in response to the prevent of the spread covid-19 with the transfer of conventional teaching methods into learning distance away or online learning (UNESCO, 2020). It is recorded from 60,228,568 students in Indonesia have been affected by school closures due to the Covid-19 pandemic. Distance teaching creates unprecedented challenges in terms of technology use and access to essential facilities in schools. The challenges that arise are due to the absence of clear guidelines on online teaching, from preparation to the evaluation process (Guangul, at al., 2020). Other issues such as infrastructure, teacher and student experience in online learning, changing working hours, and the inconvenience of working from home are additional challenges in online teaching (Zang, et al., 2020).

The learning process is not only cover the aspect of preparation, implementation of learning and the evaluation. Planning for learning evaluation activities is also essential component that contributes to the successful achievement of learning objectives. Assessment is useful for encouraging learning and providing meaningful feedback to students (Alias et al., 2015; Heitink et al., 2016). Feedback can be

used as the basis for follow-up assessments because it reflects students' actual learning more accurately (Faber & Visscherb, 2018). Information about the level of student understanding becomes essential to ensure that all students can achieve the expected potential. Especially with the outbreak of a pandemic Covid-19, it is needed to think about activities of assessment of students from a distance away that is different from before a pandemic in which the modalities of assessment of learning requires the physical presence of students. During the pandemic, the majority of teachers used existing media but still found it difficult to conduct assessments, such as Google Classroom, Quizziz, Quipper School, Zoom, Microsoft Team, Moodle, Schoology, Examview, Ruangguru, WhatsApp, and the school's e-learning website.

Educational assessment is a formal way to measure student status in correlation to the learning variables which are then needed for planning of further education improvement (Popham, 2007). Assessment activities are needed to obtain information that is used as a reference in decision making, including curriculum, learning programs, school advertisements and other school policies (Uno et al., 2012). Activity assessment of learning is also used to ensure the associated achievement of students in the aspect of knowledge, attitudes, and skills (Sunarti & Rahmawati, 2014). The term ratings refer to the methods or tools that are used by educators to conduct the evaluation and documenting readiness of the academic, learning progress, acquisition of skills, and the educational needs of students (The Glossary Education Reform; Tosuncuoglu, 2018). Assessment principles must be comprehensive, sustainable, objective, based on goals and criteria, as well as relevant, valid, and reliable (Yusuf, 2017).

Based on 2013 curriculum, *outcomes-based curriculum* or basic competencies are a set of competencies that must be achieved by students with minimum completeness criteria which at least includes aspects of material complexity, student and teacher quality, and the carrying capacity of education units (Directorate of High School Development). 2017). Formative assessment is needed in connection with providing information about students' level of understanding continuously and in real time (Ramsey & Duffy, 2016). Elmahdi et al. (2018) explains that formative assessment is used to collect evidence that can be used as a basis for improving the quality of learning. In addition, there are alternative portfolio assessments that are cumulative and can be used to assess students' knowledge and skills that are not carried out in real time (Khan & Jawaid, 2020). Ratings portfolio can be used because it has several advantages because it highlights the testing is effective, involve students in activities that complex, are comprehensive and based on the evidence, the criteria of assessment takes into account the diversity of manifestations of learning, and put students in situations similar to reality (Mogonea, 2014).

The advances in technology and e-learning system then raises the need for proper tool of measuring for the assessment of learning. (Brink & Lautenbach, 2011). The use of technology in learning assessment system offers benefits such as limitless access, limitless capacity of storage, provide accurate information and the utilization of data to meet the needs of users (Setemen et al., 2017). E- assessment can improve the quality of learning measurement and allow for immediate feedback (Appiah & Tonder, 2018). The use of technology in learning assessment activities also allows for time and cost savings, but the existing platforms have not been able to meet the needs of learning assessment activities toward education in Indonesia. It is needed a learning assessment tool that accommodates the needs of teachers and students in Indonesia and it is flexible or easy to use to manage student data and produce reports that can be used to evaluate student performance. The development of the “Cencus” web -based platform is expected to be used for communication and collaboration between educational institutions, educators, and students. Web-based assessments allow teachers to design assessments, develop question banks, and provide immediate feedback. Web-based assessment can also be used to identify student needs and encourage better learning because it can connect students to learning resources or references (Dahlan & Hussain, 2010). Therefore, it is needed to do the analysis of the usability of the development of e-assessment -based web "Census" to determine the impact of the learning activities assessment of learning in the future during the pandemic of covid-19.

Research Methodology

This research focuses on usability analysis e-assessment web-based "Cencus" to support the online learning assessment during Covid-19 Pandemic. Population on this research are high school students and vocational high students in Surakarta. Meanwhile, the selected respondents to be the research sample are 20 students in the limited trial and 20 students in broader trial. Data collected used are closed questionnaire that spread on online. Data analysis used is System Usability Scale (SUS) which aimed to measure how far this Cencus can be used by the users (Bangor et al., 2008, 2009). There is also SUS questionnaire that consisting of 10 statements below:

Table 1 Statement Items of *System Usability Scale* (SUS)

Code	Statement
S1	I think I will consider to use this system more often
S2	I find it this system is not quite complex when I use it
S3	I find the system is easy to be used
S4	I think I will need technical support to use this system
S5	I find it functions on the system are well integrated
S6	I think there are too many inconsistency in the system
S7	I imagine that one day many people will learn how to use this system quickly
S8	I find it this system is not quite practical to be used
S9	I feel confident to use the system
S10	I think I need to learn many things before I'm able to use the system

Findings and Discussion

Table 2 Score result of *System Usability Scale*

Description	SUS Score	AcceptabilityRanges	Grade Scale	AdjectiveRating
Limited trial test	66,0	Marginal-High	D	Good
Broader trial test	72,2	Acceptable	C	Good

The score of System Usability Score (SUS) showed that usability score of e-assessment media web-based Cencus when it is being tested both of limited and broader trial test. *Acceptability ranges* column showed SUS score interpretation in the level of user acceptance toward the developed system, while *grade scale* showed that level scale from the user acceptance toward the developed system and *adjective rating* showed adjective rank from the developed system. In the limited trial test, it is known that SUS score of 66,00 that showed the level acceptance of user toward the use of e-assessment media web-based Cencus and belongs to marginal high or D class scale and the characteristics of user belong to good category. Meanwhile the broader trial test, it is known that SUS score of 72,2, and it can be concluded usability from e-assessment media web-based Cencus belong to accepted of user of in the C scale class that can be well accepted by the user.

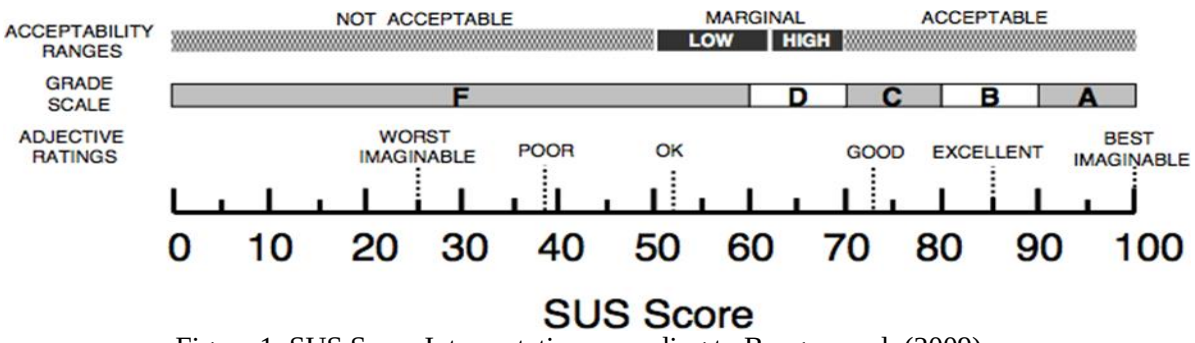

Figure 1. SUS Score Interpretation according to Bangor er al. (2009)

Based on the findings, it is known that e-assessment media web-based Cencus can be used massively because the level of acceptance from the user or usability value belongs to good category. E-assessment media web-based Cencus is analyzed using system usability scale (Bangor er al., 2009). Usability analysis has been used to evaluate the use of certain products viewed from the perspective of user (Martins er al.,2015). The use of e-learning technology is cannot be denied to be the most essential part and integral of educational process, therefore e-assessment should be the supportive aspect of online learning activity. Before that, students are asked by teacher to do the test through Cencus web. It makes the students have experience and then they are asked to fill the SUS questionnaire related to the experience during the use of the web.

Table 3 The percentage of Limited Trial Test Questionnaire result

Code	Strongly disagree	Disagree	Netral	Agree	Strongly Agree
S1	0%	0%	60%	35%	5%
S2	0%	5%	60%	35%	0%
S3	0%	15%	30%	45%	10%
S4	0%	15%	60%	25%	0%
S5	0%	30%	10%	45%	15%
S6	5%	25%	40%	30%	0%
S7	0%	5%	50%	40%	5%
S8	5%	20%	60%	15%	0%
S9	0%	20%	60%	20%	0%
S10	5%	60%	35%	0%	0%

In the stage of limited trial test, it can be seen that 55% of respondent agree that e-assessment media web-based Cencus is easy to be used and there is 35% of respondent who considers that e-assessment media web-based are both not quite complex and well-integrated. However, there is obstacle which experienced by the 15% of respondent who consider that this e-assessment media web-based Cencus is complicated to be used. Moreover, there is 25% of respondent who states that they need technical support or tutorial to use e-assessment web-based Cencus. Another finding show that this e-assessment web-based Cencus still need to be repaired in order to be user-friendly for the user.

Table 4 Broader trial test questionnaire result percentage

Code	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
S1	0%	0%	40%	35%	25%
S2	0%	45%	55%	0%	0%
S3	0%	5%	70%	20%	5%
S4	0%	30%	70%	0%	0%
S5	0%	0%	60%	20%	20%
S6	0%	15%	85%	0%	0%
S7	0%	5%	55%	20%	20%
S8	0%	20%	80%	0%	0%
S9	0%	5%	55%	35%	5%
S10	10%	65%	25%	0%	0%

Based on table 4, it showed that the e-assessment media web-based Cencus still needs improvements to make it user-friendly for the users. It can be seen that the average respondent gave a fairly good and positive response compared to respondents who gave a negative response. It showed that in broader trial test, there are also many respondents who tend to give neutral answers. Therefore, the SUS score has not been able to achieve excellent or best imaginable characteristics. In the broader

trial test, 60% of respondents expressed interest in reusing e-assessment media web-based Cencus because its easy use and well integrated, as well as 40% of respondents who feel confident when use it.

The advances of communication and information technology such as the Internet in the form of the Web (World Wide Web) are indeed very supportive for long-distance communication and information services because they are easy and efficient. Computer based Tests began to boom to be used to save time and cost compared to the written test that requires a physical presence. The closing of schools during the Covid-19 pandemic has made all learning activities carried out online, thus requiring an online learning evaluation tool that match the needs of education in Indonesia. Therefore, various type of evaluation -based web can make activity evaluation becomes more interactive and interesting (Hernawati, 2006). Another advantage of web-based evaluation tools is that it can make it easier for teachers to process grades so that they can provide and present data quickly (Wardani, 2013). Through a web-based assessment academic information system , students are also easily access various school academic information such as student schedules and grades (Yulianto et al., 2018). It can be concluded that computerization can simplify the process of assessing student learning achievement starting from calculating grades, recape time, and making reports (Nursahid et al., 2015).

SUS itself has been used for more than 20 years and can be used to evaluate websites, software, and other systems, and it is also valid to compare two or more systems (Peres et al., 2013). In the beginning, SUS was developed in English then it is adapted into Indonesian version which has proven reliable for use by considering cross-cultural adaptation and reliability tests. (Sharpina & Santoso, 2017). The SUS Questionnaire is a powerful and versatiletool for collecting users' subjective judgments about the benefit of a product (Bangor et al., 2008, 2009). Kortum & Peres (2014) showed a reliable and quite strong positive correlation between subjective usefulness measures and the level of task success at the individual and system level.

Research from Kortum & Bangor (2013) showed that SUS can provide different results between different products and important benchmarks regarding characterization and describing the results of usability research. The SUS score will be better if it can be combined with performance measurement tools so that the usability of a product becomes more comprehensive (Grier et al., 2013). It is because SUS has a drawback that only shows the user preferences without involving behavioral performance and is more suitable used to collate with the products of other (Drew et al., 2018). Nevertheless, SUS is still relevant to be used as it is to measure the usability of a product based on user preferences (Lewis & Sauro, 2009). In order to obtain the value of SUS which is better to the evaluation that can be equipped with the analysis of metrics used derived from traces of interaction (Harrati et al., 2016). When researchers and practitioners need a measuring tool about perceived usefulness, then SUS is still relevant to be used (Lewis, 2018).

Conclusion

The advance use of communication and information technology such as internet in the form of the Web (World Wide Web) allows evaluation activities including assessment of learning, especially in the distance learning period to make it more interactive and interesting. The usability test of the Cencus web - based e-assessment media to support online learning assessment in this research uses the *System Usability Scale*. The usability score of the Cencus web - based e-assessment media in a limited trial, in the number of 66 which is included in the category of upper edge acceptance level which is on the D scale class and it is belong to the good category. While the broader test phase, score reusability media e-assessment -based web Cencus in the number of 72.2 that belong to the accepted category and in the C class and it goes to good category. However, most of the respondents tended to give a neutral answer. This implies that the Cencus web-based e-assessment media still requires improvements to be better accepted by users.

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