JOURNAL OF INFORMATION TECHNOLOGY AND ITS UTILIZATION, VOLUME 3, ISSUE 2, DECEMBER-2020, 48-52
EISSN 2654-802X

THE USABILITY OF WHATSAPP MESSENGER AS ONLINE TEACHING-LEARNING MEDIA

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***Abstract*-- To prevent the spread of Covid-19, whether ready or not, education policymakers in Indonesia have established a policy of online learning from home. Some schools use a special Learning Management System (LMS) application, while others simply use existing common communication applications, including WhatsApp Messenger. This study aims to measure its usability in its use as an online learning medium. This research uses a descriptive quantitative approach. The data were obtained from an online survey of students and teachers who were determined by convenience sampling technique. Measurements were carried out with ISO for HCI and Usability 2001. The results showed that the Usability of WhatsApp was rated in the category 'sufficient', close to the category 'good'.**

***Keywords*: communication media, HCI, online learning, usability, WhatsApp.**

I. INTRODUCTION

The Covid-19 pandemic outbreak has devastated all aspects of human life, including the field of education. Therefore, to stop its spread, policymakers in the field of education in Indonesia have implemented learning from home policy. The decision that was taken so quickly forced all parties involved in it to adapt to utilize ICT in carrying out their activities whether they were ready or not [1], [2]. There are many applications on various platforms that have been created specifically to facilitate online teaching and learning activities [3]. Some are just common communication media, and others are in the form of integrative learning management systems, which are better known as a Learning Management System (LMS). Due to the complexity of using LMS, many academics prefer to use common communication media, such as WhatsApp Messenger [4]–[6].

WhatsApp is a social media application that functions to communicate, share messages, photos, files, and videos using the data network as a message delivery facility. It allows users to provide instructions, deliver course materials, announcements, and comments in the form of live text, documents, images, audios, videos, links, and even installable application programs. Apart from that, it also has the WhatsApp Groups feature which allows its users to group their communication audiences. These features make it easier for teachers and students to send and receive information, works, and learning materials [7]. It is an internet-based Instant Messaging application whose use continues to increase today. This increase is accompanied by a long duration of use and rapid understanding of its use and features. This provides an opportunity for anyone, including the academic community, to hold various online and multimedia-based virtual classes, without limitation of space and time. It is adaptable to the user's social culture, including the manners in communicating without reducing the quantity, quality, and modernity of the way of communicating [8]. Although there are concerns that students will lose focus if they use WhatsApp as a learning medium, because of its original function as social media, the research results prove that the pedagogical community of inquiry framework positively supports its use for learning purposes [9].

This raises my curiosity about its usability from a Human-Computer Interaction (HCI) perspective. The results of this study are expected to become a reference for LMS application developers. They should adopt features that are preferred by WhatsApp users in the field of education so that the choice of their LMS designs also increases. The results of this study can also confirm whether the online teaching and learning process must use a special LMS or can be allowed to use social media, especially WhatsApp, which is currently being increasingly used in the field of education.

Previous research that measured four commonly used mobile applications (WhatsApp, Facebook, YouTube, and Mail) using the System Usability Scale (SUS) resulted that the usabilities were above the standard, with WhatsApp having the highest score [10]. Yadav & Singh identified the quality factor of WhatsApp and predicted its effect on consumer satisfaction based on the ISO 9126 model. The results showed that reliability, usability, efficiency, and data integrity had a significant effect on WhatsApp consumer satisfaction. Meanwhile, functionality and portability have no significant effect on customer satisfaction [11]. They measured the usability of applications in general or other fields, while the current study measures the usability of WhatsApp specifically in terms of the implementation of online education.

Gon & Rawekar who reviewed the effectiveness of WhatsApp as a learning medium concluded that although there was no significant difference between obtaining knowledge from WhatsApp or didactic lectures, the WhatsApp feature that was able to combine media, as well as the availability of facilitators and constant learning anytime and anywhere, making it convenient for teaching and learning activities. Besides that, it also has drawbacks, such as overflood messages and eye fatigue [12]. The current research does not only measure effectiveness but also measures overall usability.

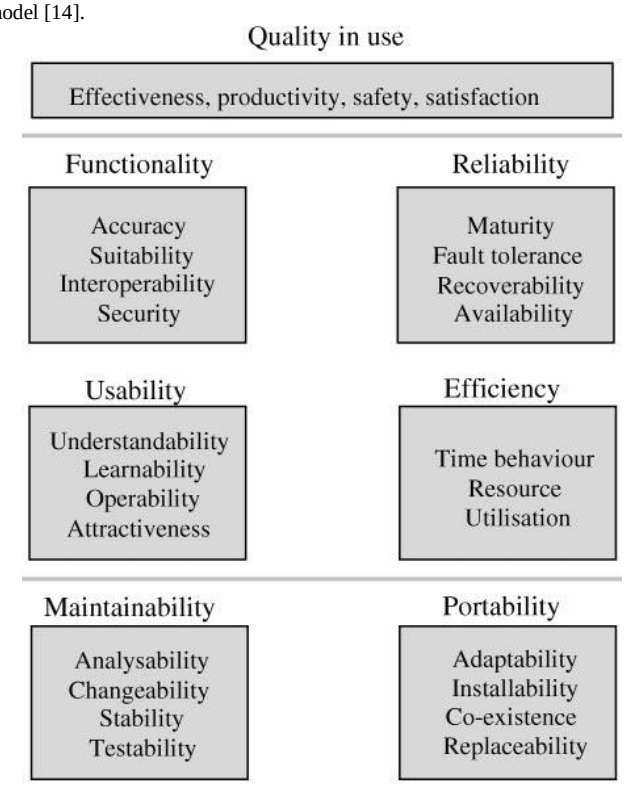
Koomson who analyzed the use of WhatsApp for online learning with four LMS features concluded that it could help solve many contextual difficulties plaguing students of e-learning situations in Ghana [13]. The current research

measures are based on the International standards for HCI and usability 2001 [14].

II. METHODS

This research uses a descriptive quantitative approach, which is to explain the data and characteristics of a phenomenon being studied without explaining the reason [15, p. 48]. Online Likert-scale survey has been done for two weeks at the beginning of December 2020 by using a convenience sampling method. It is the easiest sampling method. It targeted students and/or teachers who were willing and have time to answer questions [16, p. 56]. The scale consisted of 5 levels of marking, such as very good (5 points), good (4 points), enough (3 points), poor (2 points), and very poor (1 point). After collection, data will be displayed and interpreted.

Fig. 1. Usability Variables and Indicator base on ISO/IEC FDIS 9126-1 quality model [14].



The usability measuring tool used was the International standards for HCI and usability. The ISO 9241 defined usability as the extent to which a product can be used by certain users to achieve certain objectives with effectiveness, efficiency, and satisfaction in a particular usage context. On the other hand, the ISO 9126-1 defined it as the ability of a software product to be understood, studied, used, and attractive to users, when used under certain conditions. Based on these two definitions, the usability variables are determined to be Quality in Use, Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability, with details according to Figure 1 [14].

III. RESULT AND DISCUSSION

Of the as many as possible targetted respondents, 152 people filled out the questionnaire form. They consist of 130 students and 22 teachers or 116 girls and 36 boys, as shown in Figure 2.

Based on the respondents' assessment, the Quality in use of WhatsApp messenger in online learning is rated at 4.04 (good). Indicators of Satisfaction, Safety, and Effectiveness support this variable with rated values above 4. As shown in Figure 3, only the Productivity indicator is rated less than 4.

The result is in line with Khanna's et. al. report that WhatsApp has been used in the health sector to improve inter-departmental communication for patient safety and satisfaction [17]. It is inline with Ali & Bin-Hady's finding that the use of WhatsApp increases the motivation of EFL students to learn English, besides that it was also found that WhatsApp reduces students' anxiety about learning English [18]. It is also in line with Barhoumi's experiment finding that the learning process with WhatsApp was more effective than the entire learning process in the classroom [19]. Duke & Montag concluded a decrease in work productivity may be linked to smartphone addiction [20], however, in line with the current research result, Costa-Sánchez & Guerrero-Pico instead found that teenagers in Spain use WhatsApp in their interpersonal and group interactions for production, social, content and individual management skills, learning by doing, teaching, and evaluating [21].

Fig. 2. Profile of respondents.

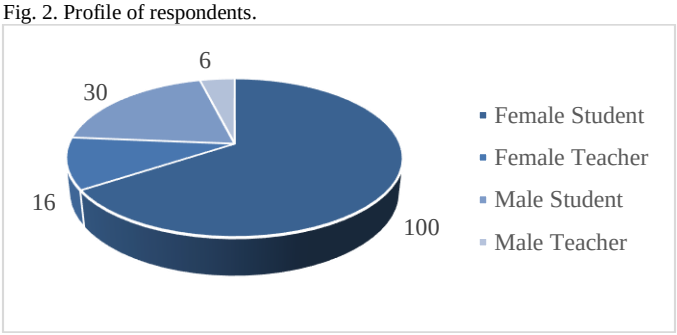
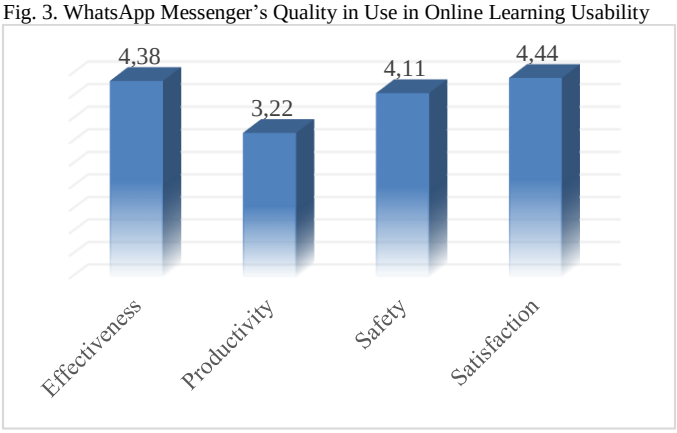


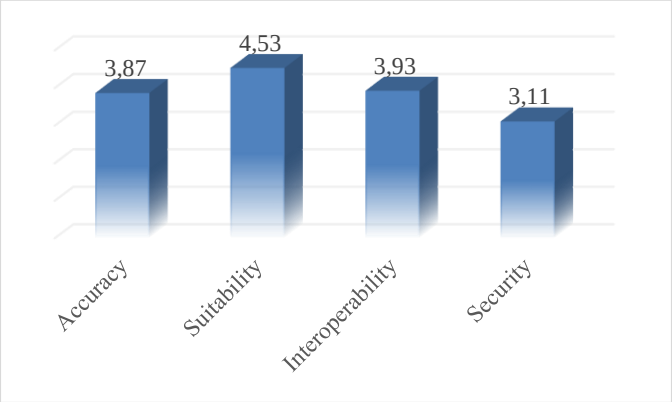
Fig. 3. WhatsApp Messenger's Quality in Use in Online Learning Usability



The functionality is rated 3.86. As shown in Figure 4, this figure is close to the category 'good'. Accuracy, Suitability, and Interoperability support this variable with rated values ranging from 3.87 to 4.53. Meanwhile, Security is still considered to be in the category 'sufficient'. This result is different from

previous research which stated functionality was not related to WhatsApp user satisfaction [11].

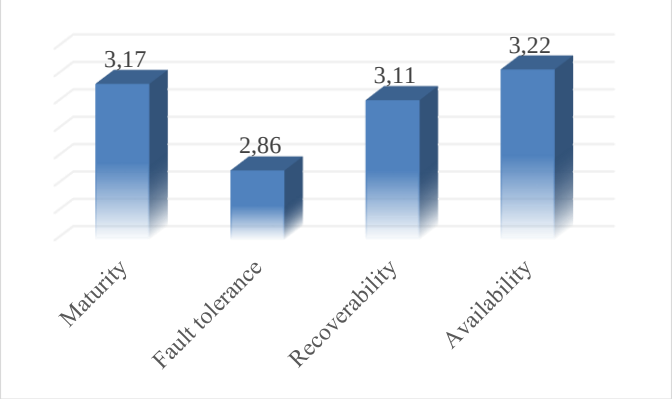
Fig. 4. WhatsApp Messenger's Functionality in Online Learning Usability



In terms of reliability, WhatsApp Messenger's usability is rated in the category 'sufficient', with a score of 3.09, as shown in Figure 5. All of its indicators are in a position of approximately the value of 3, with the lowest value on Fault tolerance that is rated 2.86, and the highest on availability that is rated 3.22.

In Figure 6, it can be seen that in the Sub-Usability, the Operability and Understandability indicators almost get an average rating of 5 points (the category 'very good'). Its learnability points also got a 4.38 rating. Only the indicator of attractiveness got a point lower than the other indicators, with an average rating of 3.22. Even then, it is still in the category 'sufficient'. As shown in Figure 7, all indicators of Efficiency get an assessment score around the category 'good', in the following order: Resource (4.07), Time behavior (3.94), and Utilization (3.71).

Fig. 5. WhatsApp Messenger's Reliability in Online Learning Usability



As presented in Figure 8, the Maintainability of WhatsApp messenger in online learning implementation received an average rating of 2.82 to 3.48. This makes it rated in the category 'sufficient'. The Stability indicator gets the highest rating in this variable, followed by the Testability, Changeability, and the last one is Analyzability.

The last variable is Portability. As shown in Figure 9, the Co-existence and Installability indicators were rated in the category 'good', with an average rating of 4.12 and 4.08. Meanwhile, Adaptability was given the category 'sufficient' rating with an assessment score of 3.54. The replaceability indicator is rated slightly below the category 'sufficient' limit, with a point gain of 2.93.

Fig. 6. WhatsApp Messenger's Sub-Usalibility in Online Learning

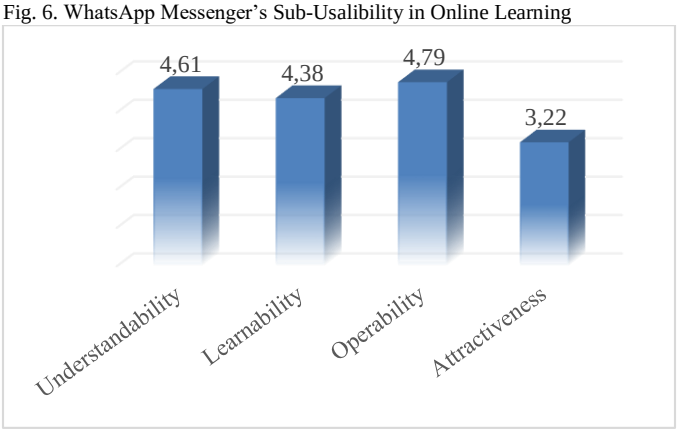


Fig. 7. WhatsApp Messenger's Efficiency in Online Learning Usability

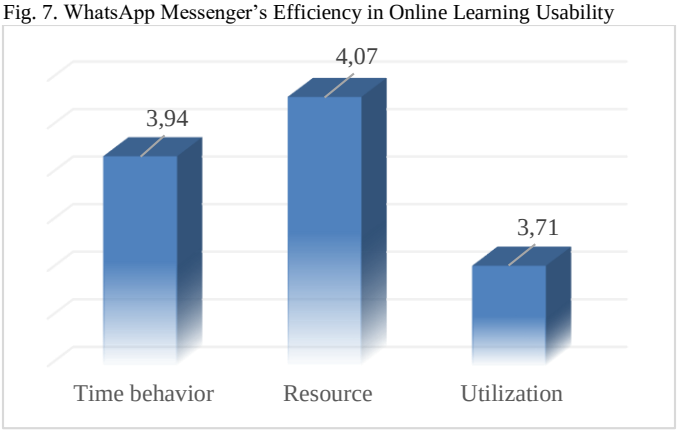
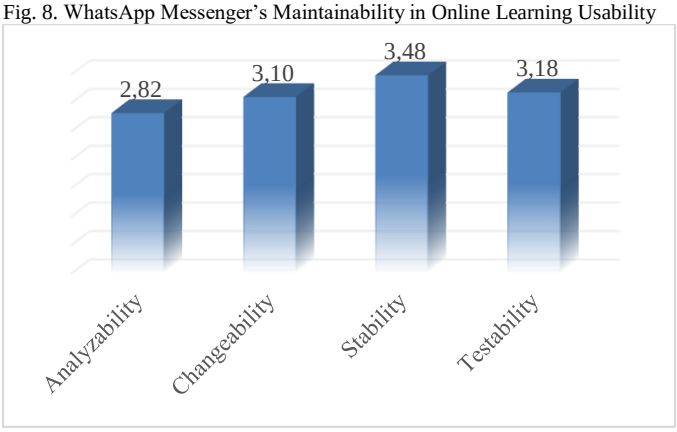


Fig. 8. WhatsApp Messenger's Maintainability in Online Learning Usability



From the assessment of WhatsApp users in teaching and learning activities on each indicator of Usability, data is obtained as presented in Figure 10. The Sub-Usability variable obtained the highest score of 4.25 points, followed by Quality in Use with a score of 4.04. Both are in the category 'good'. Conversely, the variable that gets the lowest points is Reliability with a score of 3.09, and Maintainability with a score of 3.14. However, both of them have been above the minimum threshold for the category 'sufficient'. The measurement of the Usability of WhatsApp messenger in online

learning resulted that it is in Enough Level, with point rating 3,71 of scale 5.

Fig. 9. WhatsApp Messenger's Portability in Online Learning Usability

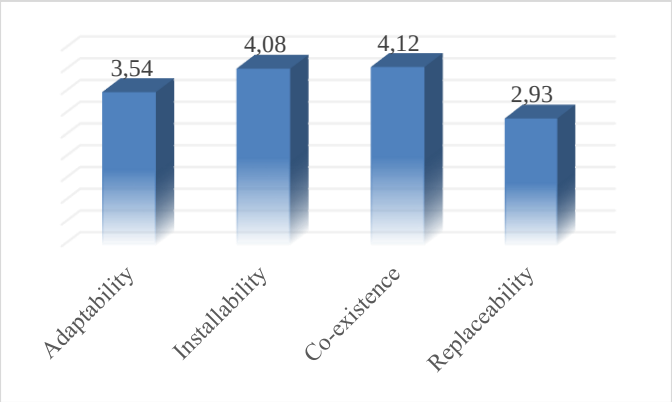
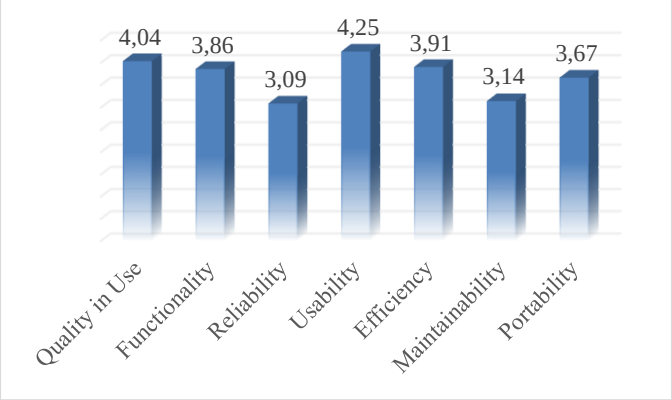


Fig. 9. WhatsApp Messenger's Portability in Online Learning Usability



The result of the current study is in line with previous research that concluded that WhatsApp usability was all above standards [10]. It also confirms a previous conclusion that it was convenient for teaching and learning activities [12]. However, on average, these results seem to contradict the findings of Yadav and Singh who give more thumbs up on the Reliability factor than Portability [11].

The advantages possessed by WhatsApp as an online teaching-learning media that have been assessed based on the perceptions of its users can be a reference for LMS developers so that users who have been choosing WhatsApp as an online teaching-learning media may drop their choice on the developed LMS. Likewise with its shortcomings. It can be used as lessons so that the development design can cover them.

The results of this research can also be used by school management who have not chosen what LMS to use. Instead of being complicated with various LMS, using WhatsApp as an online learning medium maybe not a bad choice. With the testimony of Usability from users on current research and combined with the results of previous research which concludes that there is a significant positive relationship between the use of WhatsApp as a guide media and the achievements of its users [22].

IV. Conclusion

Base on assessment using the Human-Computer Interaction (HCI) perspective, it is concluded that the usability of WhatsApp Messenger as the teaching-learning communication media in the online learning policy implementation is in the category 'sufficient', approaching the category 'good'. It excels in the average rating of all its variables. There is no single variable that falls into the category 'poor', let alone 'very poor'.

The results of this study can be a consideration for LMS developers to attract users who have already used WhatsApp for online teaching and learning activities. Besides, for those who are still using it now, there is no need to feel inferior, because it has proven to be quite useful for online teaching and learning.

This study only responded by 152 respondents. To strengthen the results of the study, it is recommended that future research increase the number of respondents. Also, this study only measures one application, namely WhatsApp Messenger as a learning medium. Future research may compare the measurement results of various instructional media platforms and LMS.

V. Acknowledgment

Gratitude goes to all parties who have supported this research, especially the 2020 apprentices from UIM Makassar, teachers of SDN Tamamaung Makassar, teachers and students of SD, SMP, and SMA Plus Budiutomo Makassar who have helped fill out and distributing questionnaires. Thanks also go to the Head of BBPSDMP Kominfo Makassar for allowing us to use the facilities to carry out this research. You also thank fellow researchers at BBPSDMP Kominfo Makassar who have motivated us to complete this research. Last but not the least, we would like to thank the reviewers who have provided comments to improve this article.

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