Student Perception of The Utilization of WhatsApp in Biological Learning

by Siti Zaenab

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Abstract

Nowadays, many students use social media such as WhatsApp to interact and communicate in learning. This study was conducted to examine the usefulness of WhatsApp in learning. This research uses a quantitative approach of survey method. A total of 252 students of UHAMKA Biology Education were selected by purposive convenience sampling. The instrument is a questionnaire in the form of a modified data collection form from Gasaymeh, Odewumi, et al. and Embi research. Rasch modelling software Winstep 4.4.4 is used for the analysis of questionnaire data. Students' perception of the use of social media WhatsApp application in learning is in asuitable category. Sixteen items are relatively easy to approve, three items are neutral, 13 items are relatively tricky to approve. The use of WhatsApp in the realm of biological learning requires clear and strict regulation from lecturers. Although it provides much ease in learning, the negative impact is also an essential consideration during the learning process.

Keywords: Perception, Social Media, WhatsApp, Rasch Modeling.

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Introduction

Nowadays, internet-based communication is growing very fast and has become a basic necessity for personal, professional and business (Golden, 2017). Today's advances in communication technologies were widely utilized to interact, share information, networking, listen to audio, make videos, create projects, and research (Alfawareh & Jusoh, 2017). Instant media applications or social media such as Facebook, Twitter, WhatsApp, Youtube, Telegram, Instagram and other applications are now widely used in the world of Education(Osgerby & Rush, 2015; Moghavvemi, Sulaiman, & Jaafar, 2018)(Riyan Rizaldi al., 2021)is not only for communication and completing administrative work but also used as a medium in the learning process. The use of social media for learning is a new learning style in the 4.0 era (Calimag, J. N.,Mugel, P. A., Conde, R. S., & Aquino, 2014; Yektyastuti & Ikhsan, 2016). Many social media applications on smartphones facilitate the dissemination of learning materials by teachers and students more efficiently and effectively. With the advancement of internet technology and applications, smartphones are used to call and share content such as images, videos, emails, news, and trade transactions. The popularity of instant messaging apps has overgrown: WhatsApp has about one billion users everyday, Facebook Messenger has about 1.3 billion monthly users (Constine, 2017)(S Pasaribu, 2021). The platform also expanded teacher-student communication outside of school hours(Bouhnik et al., 2014).

WhatsApp application is a medium that has an excellent opportunity to develop new ways of learning because its use continues to increase. Statistical data has shown that there were 1.2 billion monthly active WhatsApp users in 2017 (Statista, 2017; Gasaymeh, 2017). WhatsApp usage in Indonesia ranks second only to Youtube with 83% active use. Lim & Ahad (2014)found that WhatsApp is popular among students,using it every day. Some universities have provided new facilities and interfaces for university students and staff, but WhatsApp is the most used app. Not infrequently in universities in Indonesia, the communication relationship of learning between students and lecturers is done with WhatsApp.

The use of WhatsApp in college learning has become a new way of learning culture. With the group feature in this app, online learning begins. Lecturers give lecture materials through a WhatsApp

group of classes that have been formed. Students and lecturers are given the ease of learning in this way. Here, the discussion process is conducted anytime and anywhere according to the agreed schedule. This can help overcome time constraints between students and lecturers in exchanging information. For example, when a lecturer cannot attend a class, he can give his material through the WhatsApp group. In some countries such as Turkey, as Cetinkaya research (2017)(Riyan Rizaldi et al., 2021),India has also used the WhatsApp application to support the learning process (Gon & Rawekar, 2017).

While learning through WhatsApp groups provides flexibility for lecturers, the effectiveness of mutually beneficial learning is essential to investigate. Without an in-depth exploration of students, it is difficult to say that the use of WhatsApp in the learning process is beneficial because students' attitudes are unknown. Our study aims to gather students' perceptions of WhatsApp usage in the learning process. Based on the survey we conducted, this study has not been investigated adequately in universities in Indonesia. This study aims to identify students' views on using the WhatsApp application for biology learning at the university level in Indonesia. Experience from students is supposed to provide input to lecturers in choosing digital learning media in the future.

Method

Sample and Sampling Techniques

Descriptive Quantitative was used in this study. The purposive convenience sampling approach used in this study, where samples were taken easily accessible and willing to participate, considers predetermined criteria (Al-Emran et al., 2016)(Zakiyuddin & Reynaldi, 2021). The criteria used are students in the Biology Education Program at one of the universities in Indonesia. A total of 252 students were involved in completing the study questionnaire. Previously, we requested permission and explained the purpose of this research via email. Respondents who agree we resubmit the questionnaire in the form of Google Form. The university's ethics committee has approved the code of conduct. Respondent characteristic data is showed in Table 1.

Table 1. Respondent Demographic Characteristics.

Demographic	Respondent	Persentase (%)
Gender		
Female	221	87,70
Male	31	12,30
Age		
18-19 Years	97	38,49
20-21 Years	118	46,83
22-23 Years	36	14,29
24-25 Years	1	0,40
Semester		
2	65	25,79
4	85	33,73
6	46	18,25
8	56	22,22
Total	**252**	

Instruments

Research instruments in the form of questionnaires with a multilevel scale. The questionnaire was compiled by researchers modified from the research of Gasaymeh (2017), Odewumi, Bamigboye, Olawuyi, & Bamigboye (2018)andEmbi (2016). The number of items of statement items in the questionnaire as many as 35 items consisting of 4 indicators. Three of them are demographic questions, 8 points of statement about WhatsApp application knowledge for learning, 7 points of statement about the use of WhatsApp application personal purpose and learning, 10 points of statement about an attitude towards the utilization of WhatsApp application in learning and 7 points of statement about an attitude towards the utilization of WhatsApp application in learning. The research instrument developed to know the attitudes and views of students is a statement using the Likert scale from "strongly disagree" to "strongly agree". Statements in the form of multiple choice are used to know the respondent's data in the form of the experience of using the WhatsApp application, the frequency of use of the WhatsApp application and the usefulness of the WhatsApp application in learning.

Data Collection and Data Analysis

Data collected from questionnaires that have sent to each respondent via email. The data was analyzed using Rasch measurement models with Winstep 4.4.4 application. Rasch's analysis essentially changes the rating scale to a linear measurement unit called a 'logit' or 'log-odds. Log-odds and 'logit' are measurements built(Goh et al., 2010). Rasch is used to analyzing wright maps (item-respondents), statistical summaries, and differential item functions. Wright's map analysis was conducted to determine the level of perception of respondents. Statistical summary to find out the average value of respondents in choosing the scale listed, measuring the reliability of respondents and persons, knowing the consistency of respondents, implications of instruments on measurement, implications of data on measurement and grouping of items and respondents analyzed using statistics summary. Differential Item Function (DIF) analysis is used to determine the diversity of responses based on respondent demographics with a probability value of 0.05 (Sumintono & Widhiarso, 2013).

The grouping of respondents is done using the equation:

$$H = \frac{[(4 \times Separation) + 1]}{3}$$

Information:
H: Strata Separation Value

Result

Rasch's analysis provides two reliability values: the reliability of respondents and the reliability of items with acceptable coefficients in good categories of 0.90 and 0.99, respectively (Sumintono & Widhiarso, 2013). The coefficient value of Cronbach Alpha of 0.91 (Table 2) describes the interaction between 252 respondents with 32 items very well, followingRasch modelling requirements, so that the research instrument is feasible (reliable) to use (Sumintono & Widhiarso, 2013).

Table 2. Summary of Respondents and Item Statistics.

	Mean	Measure	Separation	Reliability	Cronbach Alpha
Responden	95,4	2,22	3,08	0,90	0,91
Item	750,9	0,00	9,37	0,99	

A measured value of 2.22 (Table 2) indicates the average value of respondents. An average score of more than 0.00 indicates a tendency for respondents to agree more on various items. The group of respondents based on the level of consistency is known through the separation values entered into the equation:

$$H = \frac{[(3.08 \, x \, 4) + 1]}{3} = 4.44$$

The results showed four groups of respondents with very high, high, medium, low consistency. These results indicate that four groups of respondents have a level of consistency in answering very high, high, medium, and low(Sumintono & Widhiarso, 2013).Grouping values used to find out the group of items based on the item's difficulty level. Data analysis shows a separation value of 9.37 (table 2). The grouping of respondents conducted using a separation equation of 9.37 then $H = \frac{[(9.37 \times 4)+1]}{3} = 12.82$which is rounded to 13 which means there are thirteen groups of items with a certain classification.

In this study, respondents visited WhatsApp social media online, while some were once a day and some visited during the break (Table 3).

Table 3. Frequency of WhatsApp Usage

Item	N	Percentage (%)
Never at all	2	0.79
Once a Month	0	0.00
Once a week	0	0.00
Once a day	2	0.79
Rest or leisure time	97	38.49
Always On	151	59.92
Total	**252**	**100.00**

The findings showed that respondents who used the most extensive WhatsApp application were in the range of 3-4 years, with a percentage of 42%. Then some students are new to WhatsApp > 1 year (Fig. 1). The most preferred use of WhatsApp by students is to communicate with 250 respondents (99%), then share the course material with a percentage of 84.9% or about 214 respondents. At the same time, the use that respondents rarely choose is a promotion or selling with a percentage of 34.1% (Table 4).
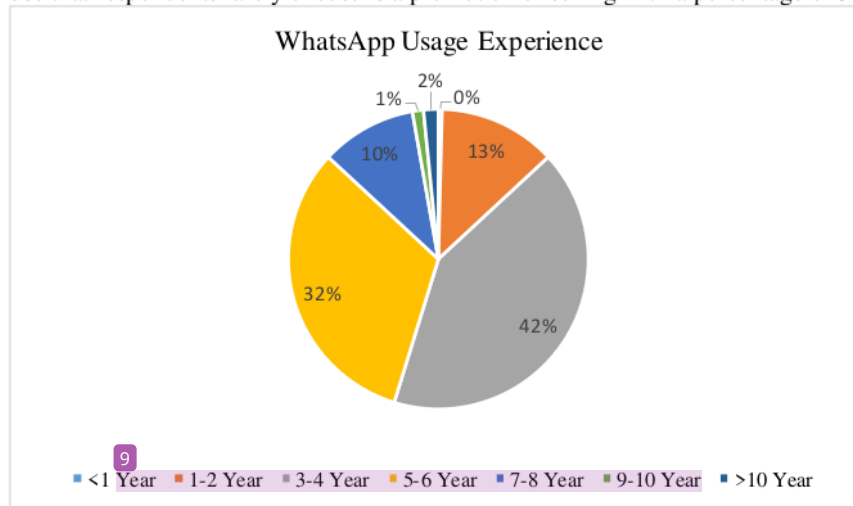

Figure 1. WhatsApp Usage Experience

The findings showed that respondents who used the most extensive WhatsApp application were in the range of 3-4 years, with a percentage of 42%. Then some students are new to WhatsApp > 1 year (Figure 1). The most preferred use of WhatsApp by students is to communicate with 250 respondents (99%), then share the course material with a percentage of 84.9% or about 214 respondents. In contrast,respondents rarely choosea promotion or selling with a percentage of 34.1% (Table 4).

Tabel4. WhatsApp Usage

Item	N	Percentage (%)
Communicate	250	99,2
Content Sharing (Photos, videos)	196	77,8
Sharing Lecture Materials	214	84,9
Location Sharing	139	55,2
Discussion Materials	187	74,2
Product Promotion/Selling	86	34,1
News/Information Sharing	153	60,7
Searching for News/Information	113	44,8

Knowledge of WhatsApp for Learning Purposes

WhatsApp item items can be used for learning media (R1) below the logit average, meaning that respondents quickly approve this item. Moreover, the R6 item (learning through WhatsApp application cannot be practical) with a logit value of 2.30 above the average logit value means it is difficult to approve.

Table 4. Knowledge of WhatsApp for Learning

Item Code	Statement	Logit Value
R1	I think the WhatsApp application can be used for learning media.	-1,27
R2	I think WhatsApp is only used for entertainment.	0,39
R3	WhatsApp app can be integrated well to support formal learning	-0,17
R4	The WhatsApp app can give universities great opportunities to support distance learning.	-0,46
R5	The integration of mobile and social media applications has been commonly used in teaching and learning	0,49
R6	I do not think learning through WhatsApp can be effective.	2,30
R7	Internet quota becomes an obstacle in learning with WhatsApp media	-0,53
R8	A good internet network is also not spread evenly depending on the respective provider.	-0,84

Use of WhatsApp for personal and learning purposes

The item statement in this indicator is denoted by the symbolized "S". Five items from seven items are below the logit average (0.00) for example, in item S2 (WhatsApp application can be used to communicate with friends, family and relatives) with a logit value of -3.28 this proves that this indicator is more widely approved and means that in this indicator most respondents choose to agree.

Table 5. Use of WhatsApp for Personal and Learning Purposes

Item Code	Statement	Logit Value
S1	Using WhatsApp, we can share files (images, audio, documents, videos) with friends.	-3,06
S2	WhatsApp can be used to communicate with friends, family and other relatives.	-3,28
S3	Using WhatsApp as a learning medium can improve and facilitate the interaction of students and lecturers.	-1,17
S4	I use WhatsApp for learning materials.	-0,18
S5	I use WhatsApp to search for task-related information.	-0,61
S6	The use of WhatsApp in learning can provide new learning methods of learning opportunities.	0,17

S7	I strongly support the use of WhatsApp for learning.	0,26

Respondents' Attitude towards The Use of WhatsApp in Learning

In item T1 (WhatsApp has a good impact on learning) with a logit value of 0.04 precisely aligned with the average logit value of 0.00, which indicates that the respondent is neutral or partially agreed on this item disapprove of.

Table 6. Attitude towards The Use of WhatsApp in Learning

Item Code	Statement	Logit Value
T1	I think the use of WhatsApp has a good impact on learning.	0,04
T2	The use of WhatsApp in learning can encourage my enthusiasm for learning.	1,01
T3	I feel that using WhatsApp can share knowledge faster.	-0,42
T4	I feel like using WhatsApp can getessential and up-to-date information.	-0,35
T5	By using WhatsApp, I can discuss directly with friends and with lecturers at any time.	-0,38
T6	I would recommend using WhatsApp in learning because it is easy to use.	0,96
T7	I find it easier to understand the material delivered by lecturers through WhatsApp groups.	2,03
T8	I always pay attention to the material delivered by lecturers through WhatsApp groups	1,24
T9	I get annoyed when I use WhatsApp to learn.	1,54
T10	I prefer to use WhatsApp because it is easy to use.	-0,21

WhatsApp for educational purposes

The use of the WhatsApp indicator for the learning process is symbolized by the letter "U". In item U1 (WhatsApp groups can improve cooperation in learning with friends) with a logit value of 0.07. U4 (the WhatsApp application can expand or deepen material anytime and anywhere) with a logit value of 0.02 is in the average logit position of 0.00. This means that the two items are neutral or even partially agree and partially disagree.

Table 7. Use of WhatsApp for Educational (Learning) Purposes

Item Code	Statement	Logit Value
U1	Using WhatsApp groups in learning can improve collaboration in learning with friends.	0.07
U2	The use of WhatsApp as a learning medium can be applied in high school or junior high school	1,51
U3	Using WhatsApp as a learning medium makes it easy for me to access materials anytime and anywhere	-0,26
U4	Using WhatsApp can expand or deepen material anytime and anywhere.	0,02
U5	Using WhatsApp as a biological learning medium will provide a fun and motivating experience.	0,98
U6	The use of WhatsApp as a medium of biological learning can increase students' learning independence.	0,84
U7	Using WhatsApp as a learning medium can save you time.	0,33

Biased by Gender

Bias is a consistent error in estimating a value. An instrument called bias is one individual with specific characteristics who are more advantaged than individuals with other characteristics. The Habit curve (Fig. 2) shows bias data according to the respondent's gender. In this case, two items, namely M25 and M30, are identified as having customs because the probability values of the two consecutive items are 0.041 and 0.0297, which means the probability value >0.05. Then on the curve also shows the difference in reliability by gender and sees the item's difficulty level illustratively.
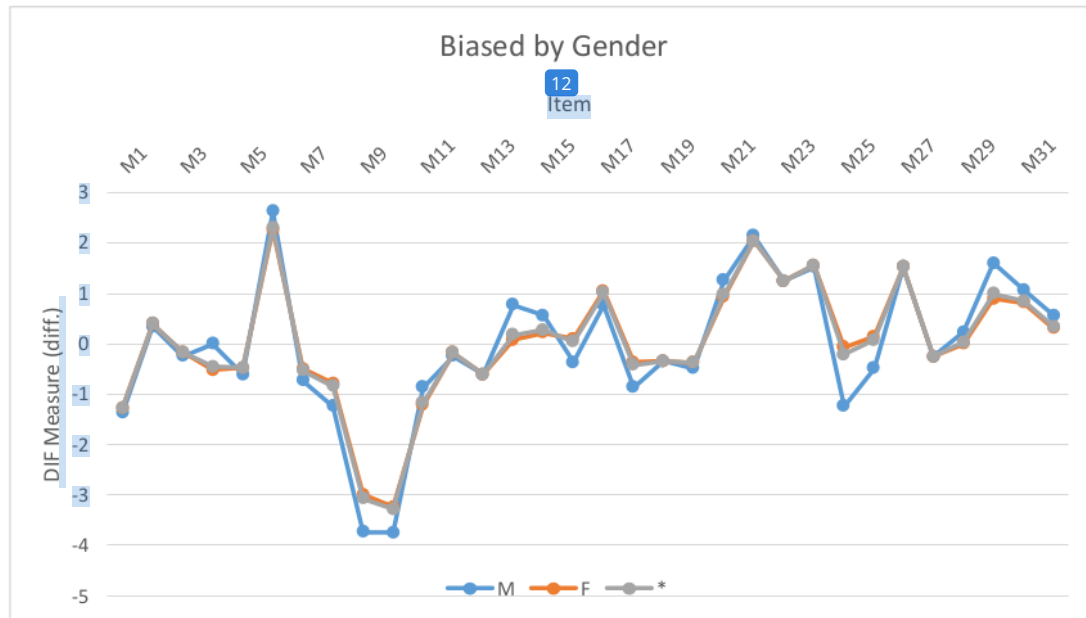

Figure 2.DIF by Gender

Discussion

This study aims to measure students' perception of the use of WhatsApp in biological learning. Precisely assess significant differences based on gender data. Data utilization of WhatsApp in various activities is used to strengthen the results of the Rasch analysis model. Students have been using the WhatsApp application for the last 3-4 years, and there are even two respondents who have been using the WhatsApp application for 9-10 years. This suggests that WhatsApp has been popular since it first existed by students as found in the research of Albergotti, MacMillan, Douglas, Rusli, & Evelyn (2014); Embi (2016)that WhatsApp was created in 2009 by Jan Koum and Brian Acton.

Students are always active in using WhatsApp every day. This shows that WhatsApp is popular among students. Nevertheless,the research found by Odewumi et al. (2018), most students use the WhatsApp app when their time is free or rest only. The usefulness of the WhatsApp application for students is very high, from all respondents using WhatsApp to communicate, share content, share lecture materials, discuss materials, share and search for information/news. Based onEmbi (2016)WhatsApp is very helpful for students to exchange information, then based on Gasaymeh (2017),most respondents use WhatsApp to stay in touch with parents, friends, and relatives every day, while also most use WhatsApp every day to share pictures and videos.

Knowledge indicators for Learning purposes

On this indicator, more respondents disagreed. Respondents considered WhatsApp ineffective when used in learning. This is similar to's (2018) research that learning will not be effective through

social media. However, Warman (2018)is disputed that 89.7% admit that using WhatsApp in blended learning is an effective way. Using the WhatsApp app for personal and learning purposes shows that respondents prefer to agree because they think the use of WhatsApp in learning can encourage enthusiasm in learning and have a good impact on learning. Similar research findings conducted by Gasaymeh (2017)show that respondents use WhatsApp for personal or learning purposes.

In the indicator,the respondent's attitude towards the use of WhatsApp in Learning shows findings of the use of WhatsApp application have a good impact on learning in line with the study's findings(Gasaymeh, 2017). The WhatsApp app for educational (learning) purposes indicates that most respondents choose to agree. However, there is one item that most respondents choose to disagree with is "Using WhatsApp as a learning medium makes it easy for me to access materials anytime and anywhere". In contrast, Gasaymeh (2017),Odewumi et al. (2018),andEmbi, (2016)research showed that WhatsApp can expand or deepen material anytime and anywhere.

Based on the DIF analysis of gender data, it was found that some items had significant differences. Here, external factors can influence one's perception. According to Walgito's statement (2010) that internal and external factors can influence a person's perception. Differences in gender-based reliability showed that men were more likely to agree on using WhatsApp as a learning medium that would provide a fun and motivating experience, Similar to Odewumi et al. (2018)study that respondents with male gender prefer to use social media for the learning process compared to female respondents. Respondents of the female gender were more likely to agree that using WhatsApp was easy to share files (photos, audio videos) than male respondents. This is in line with Odewumi et al. (2018)shows that women prefer to use social media to post pictures so that social media can provide new ways of learning.

Conclusions

Students' perceptions of the use of WhatsApp social media in biology learning have a relatively good response. They believe that the integration of WhatsApp into learning will be easier, more fun and useful. Regardless of gender, the use of WhatsApp can allow students to communicate more freely with friends and lecturers. This means students can share learning materials and study outside of lecture. The integration of WhatsApp into learning requires considering social constraints and student privacy. Further studies are needed to improve understanding regarding the use of WhatsApp in student learning.

References

Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behavior*, *56*, 93–102. https://doi.org/10.1016/j.chb.2015.11.033

Albergotti, R., MacMillan, Douglas, Rusli, & Evelyn, M. (2014). Facebook's $19 Billion Deal Sets High Bar. *The Wall Street Journal*.

Alfawareh, H. M., & Jusoh, S. (2017). *The Use and Effects of Smartphones in Higher Education The Use and Effects of Smartphones in Higher Education*. November. https://doi.org/10.3991/ijim.v11i6.7453

Bouhnik, D., Deshen, M., & Gan, R. (2014). WhatsApp Goes to School : Mobile Instant Messaging between Teachers and Students. *Journal of Information Technology Education: Research*, *13*, 217–231.

Calimag, J. N.,Mugel, P. A., Conde, R. S., & Aquino, L. B. (2014). Ubiquitous learning environment using android mobile application. *International Journal of Research in Engineering & Technology*, *2*(2), 119-128.

Cetinkaya, L. (2017). The impact of whatsapp use on success in education process. *International Review of Research in Open and Distance Learning*, *18*(7), 59–74. https://doi.org/10.19173/irrodl.v18i7.3279

Constine. (2017). *Facebook Messenger day hits 70M daily users as the app reaches 1.3B monthlies*.

Embi, M. (2016). Students' perception on the use of whatsapp as a learning tool in esl classroom. *Journal of Education and Social Sciences*, *4*, 96–104. https://doi.org/ISSN 2289-9855 2016

Gasaymeh, A. M. (2017). *University Students' use of Whatsapp and their Perceptions Regarding its Possible Integration into their Education*. *17*(1).

Goh, J. W. P., Quek, C. J., & Lee, O. K. (2010). An Investigation of Students ' Perceptions of Learning Benefits of Weblogs in an East Asian Context : A Rasch Analysis. *International Forum of Educational Technology & Society (IFETS).*, *13*(2), 90–101.

Golden. (2017). *Poll: 43% of employees use instant messaging tools on the job*.

Gon, S., & Rawekar, A. (2017). Effectivity of E-Learning through Whatsapp as a Teaching Learning Tool. *MVP Journal of Medical Sciences*, *4*(1), 19. https://doi.org/10.18311/mvpjms/0/v0/i0/8454

Lim, S. Ahad, A. D., &M. A. (2014). Convenience or nuisance?: The WhatsApp'dilemma. *Social and Behavioral Sciences*, 189–196.

Moghavvemi, S., Sulaiman, A., & Jaafar, N. I. (2018). *The International Journal of Social media as a complementary learning tool for teaching and learning : The case of youtube*. *16*(December 2017), 37–42. https://doi.org/10.1016/j.ijme.2017.12.001

Odewumi, O. M., Bamigboye, F. B., Olawuyi, O. F., & Bamigboye, O. O. (2017). Perceptions of Undergraduate Students on Social Media for Learning: A Case Study of University of Ibadan. *Journal of Communication*, *8*(2), 120–127. https://doi.org/10.1080/0976691x.2017.1336269

Osgerby, J., & Rush, D. (2015). An exploratory case study examining undergraduate accounting students ' perceptions of using Twitter as a learning support tool. *International Journal of Management Education*, *13*(3), 337–348. https://doi.org/10.1016/j.ijme.2015.10.002

Riyan Rizaldi, D., Doyan, A., Fatimah, Z., Zaenudin, M., & Zaini, M. (2021). Strategies to Improve Teacher Ability in Using The Madrasah E-Learning Application During the COVID-19 Pandemic. *International Journal of Engineering, Science and Information Technology*, *1*(2). https://doi.org/10.52088/ijesty.v1i2.47

S Pasaribu, J. (2021). Development of a Web Based Inventory Information System. *International Journal of Engineering, Science and Information Technology*, *1*(2). https://doi.org/10.52088/ijesty.v1i2.51

Sumintono, B., & Widhiarso, W. (2013). *Aplikasi Model Rasch untuk Penelitian Ilmu-Ilmu Sosial*. TrimKom Publishing House.

Walgito, B. (2010). *Pengantar Psikologi Umum*. Andy Yogyakarta.

Warman, L. A. D. (2018). Students' Perception of Using Whatsapp in Blended Learning on Reading Comprehension. *J-SHMIC*, *5*(2), 27–38.

Yektyastuti, R., & Ikhsan, J. (2016). Pengembangan Media Pembelajaran Berbasis Android pada Materi Kelarutan. *Jurnal Inovasi Pendidikan IPA*, *2*(1), 88–99. https://doi.org/https://doi.org/http://dx.doi.org/10.21831/jipi.v2i1.10289

Zakiyuddin, Z., & Reynaldi, F. (2021). The Phenomenon of "Badapu" Tradition with Nutritional Status in Postpartum Mothers in West Aceh. *International Journal of Engineering, Science and Information Technology*, *1*(1). https://doi.org/10.52088/ijesty.v1i1.42

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