

## Integrating of Digital Literacy and Achievement Motives for Learning Activities in Universities After the Covid-19 Pandemic

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**Abstract**— The research aims to analyze and describe the integration of digital literacy and achievement motives in post-covid-19 post-pandemic tertiary learning activities using a quantitative method with a correlational approach. The research location was at the Sharia Faculty of UIN Raden Fatah Palembang, from a population of 256 students. Data was collected using observation, documentation, and questionnaires. The results of the study found that the integration of digital literacy and achievement motives partially and simultaneously had a low effect on post-covid-19 learning activities. It was concluded that learning activities at the Sharia Faculty of UIN Raden Fatah Palembang had combined digital literacy with achievement motives in learning activities that had not been fully successful. It is recommended that total changes be made to learning activities by maximizing digital literacy integration and increasing achievement motives for lecturers and students. Learning activities will not run effectively if digital literacy interactions with achievement motives from lecturers and students are not carried out optimally.

**Keywords**— Integration, Learning Activities, Motives for Achievement

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### I. INTRODUCTION

In the millennial era like today, the implementation of digital-based learning in the university environment has become imperative, because this model is considered more effective. Likewise, the achievement motives of each student and lecturer (Kang & Kim, 2021). The acceleration

of digital literacy in all formal educational institutions is a positive impact of the outbreak of the corona-19 virus attack that has hit the world. This situation forces all learning activities to be carried out from home (learning from home) using the help of the internet (Shalikhah et al., 2023). During the outbreak of the COVID-19 pandemic,

all learning activities were carried out online (Craik et al., 2019). The conventional learning process in classrooms has been moved from their respective homes using internet network media (Bastaman et al., 2021). So that all learning activities are almost carried out using the help of information technology.

After the end of the COVID-19 pandemic, learning activities did not fully return to the previous pattern (Morse et al., 2020), namely conventional learning patterns that were entirely in classrooms (Aldowah et al., 2019). Activities must be innovated by integrating conventional learning with digital-based learning (blended learning) (Le Berre et al., 2020). However, the implementation of digital-based learning still faces many obstacles. The weak teaching after the COVID-19 pandemic can be seen from the availability of resources such as very slow and unreliable and unstable internet connections, noisy online classrooms and lack of privacy during online classes, weak licensed/registered Learning Management System (LMS) and lack of computers and internet connections for some educators (Rosmayati & Maulana, 2021). After the COVID-19 pandemic, it is believed that there are still many weaknesses in the use of digital e-learning (Van Workum et al., 2019). The most important thing is the mastery of digital literacy by lecturers and students. Integrating digital literacy in learning activities is only a tool (Mangaroska & Giannakos, 2019). Learning activities do not get perfect results if they are not accompanied by the motive to achieve high achievements from each lecturer and student (Claria & Sariani, 2020). The motive for achievement is a trigger for lecturers and students so that they are able to study hard, study smart, study sincerely, and study thoroughly (Wu et al., 2019). If digital literacy and achievement motives can be integrated, it is estimated that it will give birth to qualified learning activities.

From observations during the Covid-19 pandemic at the Sharia Faculty of UIN Raden Fatah Palembang, it can be seen that digital literacy and achievement motives have not been perfectly

negated among students and lecturers (Kurniawan et al., 2019). Most lecturers are still weak in mastering digital literacy and have low achievement motives. As a result, there is learning loss or loss of learning opportunities for lecturers and students. The results of (Indrawati et al., 2020) found that only 68% of students in nine provinces had access to learning from home (PJJ). In the PJJ learning process, some students only receive instructions from lecturers, without any initiative to look for themselves. This means that students as a learning center (student center) must actively explore various information and knowledge, both inside and outside the classroom (Van Workum et al., 2019). Students and lecturers who have an achievement motive will not reduce the portion of learning, both face-to-face in class and carrying out information technology (digital) based lectures.

The pattern of learning in the post-covid pandemic that is digital-based goes hand in hand with the development of public education in the industrial revolution 4.0 and social revolution 5.0, where the use of digital technology is increasingly pervasive into all "joints of social life." According to (Theffidy, 2020), education in the industrial revolution era must integrate cyber technology into learning activities (Mangaroska & Giannakos, 2019). All educational activities are required to adjust to technological developments and utilize digital technology as a facility to facilitate the learning process (Putriani & Hudaiddah, 2021) (Desmaniar et al., 2020). The industrial revolution has had an impact in the form of fundamental changes in human civilization in the education sector (Dito & Pujiastuti, 2021).

The learning process in the post-COVID-19 pandemic era requires all lecturers and students to master electronic-based learning activities (Irwandani et al., 2019). For lecturers born before the millennial generation era, there are still many who stutter technology (Reffiane et al., 2019). Moving on from the above problems, the question arises "can the integration of digital literacy and achievement motives have a positive effect on

learning activities in universities?" It is estimated that the integration of digital literacy and achievement motives is an important part of learning activities in higher education environments (Hikmi et al., 2020). The integration of digital literacy and achievement motives in learning activities after the COVID-19 pandemic within the Sharia Faculty of UIN Raden Fatah Palembang is important to be researched.

## II. METHODOLOGY

The research was carried out at the Sharia Faculty of UIN Raden Fatah Palembang which took place from August to December 2022 (Guess et al., 2020). The research method uses a correlational approach (Sudjana, 2005), so the research design is designed to analyze the effect of integrating digital literacy and achievement motives on learning activities.

The population of this study is all active students at the Sharia Faculty of UIN Raden Fatah Palembang in the 2021/2022 academic year, totaling 176 people (Estacio et al., 2019). The sample of 64 students was randomly taken at 10% precision using the Slovin formula (Bastaman et al., 2021).

*The data collection technique uses a closed questionnaire in the form of a series of statements given to students willing to become respondents.*

Before use (Sieck et al., 2021), the questionnaire is first examined by three education management experts (Guess et al., 2020). After all the statement items were deemed appropriate, the next step was to test the questionnaire with 20 trial respondents to determine the level of validity and reliability. The measurement results of 43 statement items derived from three variables, it turns out that there is only one statement item that is invalid, so that the fallen statement item is excluded from the list of statements.

Data analysis techniques begin with testing analysis requirements tests. Once all the data are qualified, the next step is to prove the hypothesis by using parametric statistics (Crawford & Serhal, 2020). The data analysis step is carried out by calculating multiple correlation values, determination analysis, significance analysis, and multiple regression analysis using the help of the SPSS for Window Version 25 Program.

## III. RESULT AND DISCUSSION

The analysis aims to answer the hypothesis proposed, namely "the integration of digital literacy and achievement motives has a positive effect on learning activities in universities." The results of multiple correlation analysis using the SPSS Version 25 for Window Program can be seen from the output in the following summary model table.

**Table 1. Termination Coefficient  
Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0,462 <sup>a</sup>	0,214	0,188	5,209	

a. Predictors: (Constant), Digital Literacy Integration ( $X^1$ ), Achievement Motive ( $X^2$ )

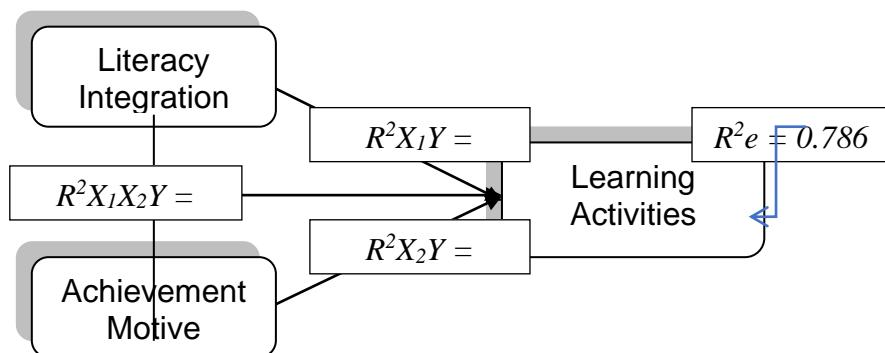
b. Dependent Variable: Learning Activities ( $Y$ )

From the table above, it can be seen that the correlation value (R) of integrating digital literacy with learning activities is 0.462a This value shows the "medium" relationship category because it is in the range of 0.40 – 0.599. (Arikunto, 2010). While

the large influence (R2) contributed from integrating digital literacy (X) on learning activities (Y) obtained a value of 0.214 which is included in the "medium" category, because it is in the 0.10 – 0.29 (Suwardi & Samino, 2014). The influence

contributed by the variable of integration of digital literacy and achievement motives on the results of student learning activities was 21.4%, the

remaining 78.6% was influenced by other variables that were not included in this study.



**Figure 1 Influence Between Variables**

Multiple correlation significance test between the integration of digital literacy and achievement motives for learning activities as presented in table 2. The results of the analysis obtained a Fcalculate value of  $8.282 > 0.001^b$  at degrees of freedom (df) =  $n - k$  or  $63 - 2 = 61$  ( $n$  = number of respondents and  $k$  = number of independent variables). The

Fcalculate value greater than the criticism table value of 0.001 shows that simultaneously the integration of digital literacy with achievement motives has a significant effect on learning activities (McGuinness & Fulton, 2019). Thus, the results of this study reject  $H_0$  and accept  $H_a$  proposed in the research hypothesis.

**Table 2. Simultaneous Test Results (F)**

Model		Sum Squares	of df	Mean Square	F	Sig.
1	Regression	449,495	2	224,747	8,282	0,001 <sup>b</sup>
	Residual	1655,365	61	27,137		
	Total	2104,859	63			

a. Dependent Variable: Learning Activities ( $Y$ )

b. Predictors: (Constant), Digital Literacy Integration ( $X^1$ ), Achievement Motive ( $X^2$ )

The determination of the multiple linear regression equation is based on the table in table 2 above with the formula of the multiple linear correlation coefficient as follows (Van Deursen, 2020).  $Y = a + b_1X_1 + b_2X_2$ . The value of  $a$  is obtained from the constant value while the value is obtained from the value of digital literacy and the value of the achievement motive, then the linear regression equation can be formulated  $Y = 449.495 + 224.747X_1 + 27.137X_2 + e$ . From the results of the multiple linear regression equation, it can be interpreted that when the variables of integration of

digital literacy and achievement motives are in a constant state, the value of learning activities ( $Y$ ) is 449.495 (Solomon & Rudin, 2020). If the value of digital literacy integration ( $X_1$ ) is increased by 224.747, the value of the achievement motive variable ( $X_2$ ) is increased by 27.137, it is predicted that there will be an increase in the learning activity variable by one unit assuming the digital literacy integration variable and achievement motive are in constant circumstances.

The influence contributed by the variable of digital literacy integration and achievement motives on learning activities at the Sharia Faculty of UIN Raden Fatah Palembang is included in the "medium" category, which is 21.4%. The results of this study inform that the integration of digital literacy together with the achievement motives of lecturers and students at the Sharia Faculty of UIN Raden Fatah Palembang has not contributed optimally to learning activities after the Covid-19 pandemic.

The results of this study are in line with the findings of (Maisaroh & Rostrieningsih, 2010); (Widayanti, 2014); (Suprihatin, 2015); (Purwanto et al., 2023); (Slamet et al., 2021); (Fitriana et al., 2022) which essentially finds that motives as a person's strength can cause the level of willingness in carrying out an activity. The willingness to achieve the best comes from two main sources, namely from within oneself (intrinsic motivation) and from outside oneself (extrinsic motivation). How strong an individual's achievement motive is will determine the quality of behaviour he displays, whether in the context of studying, working or in other lives (Tieman, 2020). Learning activities will succeed in achieving high achievements when lecturers and students have the motive to achieve them (Harapan, 2019).

The acquisition of learning outcomes that are not optimal, requires lecturers and students to behave creatively by awakening their achievement motives, because with their creativity, a lecturer must be able to encourage students to achieve high achievements in learning activities. Learning using e-learning according to (Yazdi, 2012) is a learning process that is poured through digital technology. In addition to the principle of e-learning, learning activities need to consider the principles of simplicity, personality, and speed.

To add interest in digital learning, lecturers can use games theory (Dunn & Hazzard, 2019). In games theory, the communication between lecturers and students needs to be designed like conventional learning (Solomon & Rudin, 2020). Here it is

necessary to develop the right e-learning model according to needs. Digital licensing integration must be developed in accordance with the existing system. In this system there are two contents, namely (Bhatti, 2019): lecturer and student content. Lecturer content has wide accessibility such as making questions, giving assignments, making academic announcements (Chandrasekar et al., 2020), uploading course materials, checking and announcing exam results. While student content is only limited to viewing access (academic announcements, exam results), taking exams, downloading course materials and reporting assignments (Bhatti, 2019). In addition, there are interactive activities between lecturers and students, namely chatting, discussion. Mastery of content from lecturers and students requires mastery of digital literacy (Slamet et al., 2021).

The development of virtual technology can affect the learning process that is used for learning needs, where students are positioned as learning subjects who hold the main goal. In the setting of learning activities, students are required to fully study teaching materials (Alhammadi et al., 2020). This means that students must have high digital literacy in learning. In learning activities, the presence of lecturers is placed as an external factor for students. Here externally lecturers as the main actors provide information, then in learning lecturers act more as facilitators, managing various resources and facilities for students to learn (Sanjaya, 2017).

The achievement of student learning outcomes based on the integration of digital literacy and achievement motives has several characteristics, including: (1) carried out consciously and planned systematically; (2) foster interesting and challenging attention and motivation; (3) use appropriate and interesting study aids; (4) create a safe and enjoyable learning atmosphere; (5) receive lessons both physically and psychologically (A & Haryanto, 2004).

Through the integration of digital literature and the existence of high achievement motives, it is

estimated to be able to increase learning activities to be more qualified (Janiah et al., 2021). Mastery of digital literacy with the motive of achieving lecturers and students at the Sharia Faculty of UIN Raden Fatah Palembang has not shown a high influence. This finding has similarities with Indrawati's study, et.al nine provinces showed that through PJJ, only 68% of children get access to learning from home. This condition is exacerbated by students who carry out PJJ not getting the same quality of learning as before the pandemic. Many students receive only limited instruction, feedback, and interaction from their educators (Indrawati et al., 2020).

Similar findings were also produced from the Puslitjak and Inovasi study which showed the loss of student learning ability in literacy and numeracy before and during the pandemic equivalent to 5-6 months after 12 months of learning from home (A & Haryanto, 2004). The same study also found that when students do not master the subject matter that should be studied in one year, it will have a compound effect on what students can learn at the next level (Purwanto et al., 2020). The results of the (Purwanto, 2023) also found that there is a greater risk from the widening learning gap. Learning during the pandemic has had a greater impact on some student groups. Learners who come from families with lower socioeconomic backgrounds are more at risk of not being enrolled anymore or no longer participating in learning activities. In addition, the widening gap in student learning outcomes during the pandemic (Rahman et al., 2020).

To answer the integration of digital literacy with achievement motives, the implementation of education after the COVID-19 pandemic must be adjusted to the new curriculum currently being developed. The independent learning curriculum is a "breakthrough" that is expected to be able to "open windows so that the world is in the grip" by utilizing the internet of things (IoT). (Putriani & Hudaibah, 2021) explained the correlation of the industrial revolution and social revolution with the

Indonesian education system, where the learning system fully applies creativity, critical thinking, cooperation, communication skills, sociality, and character skills, with several aspects of learning components. (Argaheni, 2020) stated that there are five impacts of digital literacy experienced by students, namely: (a) online learning is still confusing, (b) becomes passive, less creative and unproductive, (c) accumulation of information/concepts on less useful, (d) experiencing stress, and (e) there is an increase in language literacy skills. Therefore, successful learning activities are not enough just with digital literacy, but must integrate digital literacy with achievement motives and other components.

#### IV. CONCLUSIONS

It was concluded that the integration of digital literacy with the achievement motives of lecturers and students simultaneously had a significant effect on learning activities at the Sharia Faculty of UIN Raden Fatah Palembang. The results found that although simultaneously the integration of digital literacy and achievement motives had a significant influence on learning activities, the influence was included in the "moderate" category.

#### V. REFERENCES

Aldowah, H., Al-Samarraie, H., & Fauzy, W. M. (2019). Educational data mining and learning analytics for 21st century higher education: A review and synthesis. *Telematics and Informatics*, 37, 13–49. <https://doi.org/10.1016/j.tele.2019.01.007>

Alhammadi, S., Archer, S., & Asutay, M. (2020). Risk management and corporate governance failures in Islamic banks: A case study. *Journal of Islamic Accounting and Business Research*, 11(9), 1921–1939. <https://doi.org/10.1108/JIABR-03-2020-0064>

Bhatti, M. (2019). Managing Shariah Non-Compliance Risk via Islamic Dispute Resolution. *Journal of*

*Risk and Financial Management*, 13(1), 2. <https://doi.org/10.3390/jrfm13010002>

Chandrasekar, R., Chandrasekhar, S., Sundari, K. K. S., & Ravi, P. (2020). Development and validation of a formula for objective assessment of cervical vertebral bone age. *Progress in Orthodontics*, 21(1), 38. <https://doi.org/10.1186/s40510-020-00338-0>

Craik, A., He, Y., & Contreras-Vidal, J. L. (2019). Deep learning for electroencephalogram (EEG) classification tasks: A review. *Journal of Neural Engineering*, 16(3), 031001. <https://doi.org/10.1088/1741-2552/ab0ab5>

Crawford, A., & Serhal, E. (2020). Digital Health Equity and COVID-19: The Innovation Curve Cannot Reinforce the Social Gradient of Health. *Journal of Medical Internet Research*, 22(6), e19361. <https://doi.org/10.2196/19361>

Darmaji, D., Supriyanto, A., & Timan, A. (2019). Sistem Penjaminan Mutu Internal Sekolah Untuk Meningkatkan Mutu Lulusan. *JMSP (Jurnal Manajemen Dan Supervisi Pendidikan)*, 3(3), 130–136.

Dunn, P., & Hazzard, E. (2019). Technology approaches to digital health literacy. *International Journal of Cardiology*, 293, 294–296. <https://doi.org/10.1016/j.ijcard.2019.06.039>

Estacio, E. V., Whittle, R., & Protheroe, J. (2019). The digital divide: Examining socio-demographic factors associated with health literacy, access and use of internet to seek health information. *Journal of Health Psychology*, 24(12), 1668–1675. <https://doi.org/10.1177/1359105317695429>

Guess, A. M., Lerner, M., Lyons, B., Montgomery, J. M., Nyhan, B., Reifler, J., & Sircar, N. (2020). A digital media literacy intervention increases discernment between mainstream and false news in the United States and India. *Proceedings of the National Academy of Sciences*, 117(27), 15536–15545. <https://doi.org/10.1073/pnas.1920498117>

Hasanah, M. (2021). The Role of Parents in Children Memorizing the Qur'an in Middle School Based on the Amanatul Ummah Islamic Boarding School. *Tafkir: Interdisciplinary Journal of Islamic Education*, 2(2), 139–156.

Hikmi, R., Simorangkir, M., & Sudrajat, A. (2020). Development Of Interactive Multimedia Lectora Inspire Problem Based On Science. *Journal of Physics: Conference Series*, 1485(1), 012036. <https://doi.org/10.1088/1742-6596/1485/1/012036>

Irwandani, Umarella, S., Rahmawati, A., Meriyati, & Susilowati, N. E. (2019). Interactive Multimedia Lectora Inspire Based on Problem Based Learning: Development in The Optical Equipment. *Journal of Physics: Conference Series*, 1155, 012011. <https://doi.org/10.1088/1742-6596/1155/1/012011>

Kang, S., & Kim, Y. (2021). Examining the quality of mobile-assisted, video-making task outcomes: The role of proficiency, narrative ability, digital literacy, and motivation. *Language Teaching Research*, 136216882110479. <https://doi.org/10.1177/1362168821104794>

Kurniawan, R. B., Mujasam, M., Yusuf, I., & Widyaningsih, S. W. (2019). Development of physics learning media based on Lectora Inspire Software on the elasticity and Hooke's law material in senior high school. *Journal of Physics: Conference Series*, 1157, 032022.

<https://doi.org/10.1088/1742-6596/1157/3/032022>

Le Berre, C., Sandborn, W. J., Aridhi, S., Devignes, M.-D., Fournier, L., Smaïl-Tabbone, M., Danese, S., & Peyrin-Biroulet, L. (2020). Application of Artificial Intelligence to Gastroenterology and Hepatology. *Gastroenterology*, 158(1), 76-94.e2. <https://doi.org/10.1053/j.gastro.2019.08.058>

Mangaroska, K., & Giannakos, M. (2019). Learning Analytics for Learning Design: A Systematic Literature Review of Analytics-Driven Design to Enhance Learning. *IEEE Transactions on Learning Technologies*, 12(4), 516–534. <https://doi.org/10.1109/TLT.2018.2868673>

McGuinness, C., & Fulton, C. (2019). Digital Literacy in Higher Education: A Case Study of Student Engagement with E-Tutorials Using Blended Learning. *Journal of Information Technology Education: Innovations in Practice*, 18, 001–028. <https://doi.org/10.28945/4190>

Morse, J. S., Lalonde, T., Xu, S., & Liu, W. R. (2020). Learning from the Past: Possible Urgent Prevention and Treatment Options for Severe Acute Respiratory Infections Caused by 2019-nCoV. *ChemBioChem*, 21(5), 730–738. <https://doi.org/10.1002/cbic.202000047>

Reffiane, F., Iswari, R. S., & Marwoto, P. (2019). The effectiveness of Lectora Inspire media assisted guided inquiry method on the students' critical thinking skill in the science nature: A case study at gugus Diponegoro elementary schools Semarang. *Journal of Physics: Conference Series*, 1170, 012078. <https://doi.org/10.1088/1742-6596/1170/1/012078>

Shalikhah, N. D., Sari, K. P., Iman, M. S., Oktradiksa, A., Nugroho, I., & Aufa, M. (2023). *Utilization Kinemaster in making learning videos for elementary school teachers*. 020045. <https://doi.org/10.1063/5.0125788>

Sieck, C. J., Sheon, A., Ancker, J. S., Castek, J., Callahan, B., & Siefer, A. (2021). Digital inclusion as a social determinant of health. *Npj Digital Medicine*, 4(1), 52. <https://doi.org/10.1038/s41746-021-00413-8>

Solomon, D. H., & Rudin, R. S. (2020). Digital health technologies: Opportunities and challenges in rheumatology. *Nature Reviews Rheumatology*, 16(9), 525–535. <https://doi.org/10.1038/s41584-020-0461-x>

Tieman, M. (2020). Measuring corporate halal reputation: A corporate halal reputation index and research propositions. *Journal of Islamic Marketing*, 11(3), 591–601. <https://doi.org/10.1108/JIMA-05-2018-0095>

Tubagus, M., Muslim, S., & Suriani, S. (2020). Development of Learning Management System-Based Blended Learning Model using Claroline in Higher Education. *International Journal of Interactive Mobile Technologies (IJIM)*, 14(06), 186. <https://doi.org/10.3991/ijim.v14i06.13399>

Van Deursen, A. J. (2020). Digital Inequality During a Pandemic: Quantitative Study of Differences in COVID-19-Related Internet Uses and Outcomes Among the General Population. *Journal of Medical Internet Research*, 22(8), e20073. <https://doi.org/10.2196/20073>

Van Workum, F., Stenstra, M. H. B. C., Berkelmans, G. H. K., Slaman, A. E., Van Berge Henegouwen, M. I., Gisbertz, S. S., Van Den Wildenberg, F. J. H., Polat, F., Irino, T., Nilsson, M., Nieuwenhuijzen, G. A. P., Luyer, M. D., Adang, E. M., Hannink, G., Rovers, M. M., & Rosman, C. (2019). Learning Curve and Associated

Morbidity of Minimally Invasive Esophagectomy: A Retrospective Multicenter Study. *Annals of Surgery*, 269(1), 88–94.  
<https://doi.org/10.1097/SLA.000000000000246>

9

Wu, L., Wang, Y., Li, X., & Gao, J. (2019). Deep Attention-Based Spatially Recursive Networks for Fine-Grained Visual Recognition. *IEEE Transactions on Cybernetics*, 49(5), 1791–1802.  
<https://doi.org/10.1109/TCYB.2018.2813971>