8

Islamic Education Comprehension among Engineering Students: Effects of Attitude and Motivation to Learn as an Antecedent Mediator

***Rinaldi[1], Sri Rizki Putri Primandari[2], Deni Wahyuni[3], Mohd Isa Hamzah[4], Masnaini Alimin[5]**

[1,3]Politeknik Negeri Padang, Jl. Kampus, Padang, West Sumatra, Indonesia
[2]Universitas Negeri Padang, Padang, West Sumatra, Indonesia
[4]Universiti Kebangsaan Malaysia, Lingkungan Ilmu, 43600 Bangi, Selangor, Malaysia
[5]Ewha Women University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul, Korea Selatan
*rinaldi@pnp.ac.id

ABSTRACT: *This study aimed to analyse the effect of attitudes and motivation to learn on Islamic education comprehension among engineering students. It also identified the role of motivation as a mediator between attitude and Islamic education comprehension. This study employed a quantitative method with a survey study. The participants were first-year and end-year engineering students in Higher Education Institutions who were chosen by purposive sampling. Data were gathered from 250 samples by using one set of questionnaires. SmartPLS with Structure Equation Modeling was carried out to analyse data. Furthermore, path analysis at two-tailed significance ($p<0.05$) examines hypotheses and the effect of each antecedent on Islamic education comprehension. The findings of this study confirmed that attitude had no significant impact on Islamic education comprehension among engineering students. But attitude affects the motivation to learn. Motivation to learn affects Islamic education comprehension. These findings reveal that motivation to learn is a significant antecedent as a mediator in the relationship between attitude and Islamic education comprehension. This study is limited by a questionnaire to gather the data and area restrictions. This study involved Muslim engineering students in higher education institutions who have not been assigned to other studies on Islamic education. Generally, other Islamic education studies analyse subjects in Madrasah or other Islamic education institutions.*

Penelitian ini bertujuan untuk menganalisis pengaruh sikap dan motivasi belajar terhadap pemahaman pendidikan Islam di kalangan mahasiswa teknik. Penelitian ini juga mengidentifikasi peran motivasi belajar sebagai mediator antara sikap dan pemahaman pendidikan Islam. Penelitian ini menggunakan metode kuantitatif dengan studi survei. Partisipan adalah mahasiswa teknik tahun pertama dan akhir tahun di Institusi Pendidikan Tinggi yang dipilih secara purposive sampling. Data dikumpulkan dari 250 sampel dengan menggunakan satu set kuesioner. SmartPLS dengan Structure Equation Modeling dilakukan untuk menganalisis data. Selanjutnya, analisis

[1] orcid id: http://orcid.org/0000-0003-2718-7672
[2] orcid id: http://orcid.org/0000-0002-1279-7331
[5] orcid id: http://orcid.org/0000-0002-3540-3040

DOI: https://doi.org/10.35723/ajie.v8i3.670

jalur pada signifikansi dua sisi ($p<0,05$) menguji hipotesis dan pengaruh setiap anteseden terhadap pemahaman pendidikan Islam. Temuan penelitian ini menegaskan bahwa sikap tidak memiliki dampak signifikan terhadap pemahaman pendidikan Islam di kalangan mahasiswa teknik. Namun, sikap memengaruhi motivasi belajar. Motivasi belajar memengaruhi pemahaman pendidikan Islam. Temuan ini mengungkapkan bahwa motivasi belajar merupakan anteseden signifikan sebagai mediator dalam hubungan antara sikap dan pemahaman pendidikan Islam. Penelitian ini dibatasi oleh kuesioner untuk mengumpulkan data dan batasan area. Penelitian ini melibatkan mahasiswa teknik muslim di lembaga pendidikan tinggi yang belum ditugaskan untuk mempelajari mata kuliah lain tentang pendidikan Islam. Secara umum, studi pendidikan Islam lainnya menganalisis mata kuliah di Madrasah atau lembaga pendidikan Islam lainnya.

Keywords: *Quality Education, Learning Attitude, Learning Motivation, Mediator Andeseden.*

Received: *June 27, 2024;* ***Revised:*** *July 13, 2024;* ***Accepted:*** *August 31, 2024*

I. INTRODUCTION

Islamic education as one of the university courses (MKU) in public universities is essential in forming students' character and religious understanding. This education aims to provide spiritual knowledge while forming attitudes and behaviours under Islamic values (Saada, 2023). Teaching Islamic education among engineering students presents a unique challenge because engineering prioritises science and technology (Suyadi et al., 2022). Therefore, an in-depth study is needed to understand how students' attitudes towards Islamic education affect their understanding, with learning motivation as a mediating factor. Islamic education within the MKU framework is designed to equip students with basic knowledge and understanding of Islamic education and integrate Islamic values into everyday life (Parhan et al., 2024). This is crucial for shaping student character to possess academic and moral integrity (Abdullah, 2017; Juhaidi et al., 2024). Engineering students must learn Islamic education to have ethical and spiritual values in their future professional practice.

The ethical and spiritual values taught through Islamic education not only build character but also become a solid moral foundation for facing challenges in the workplace. However, every student requires readiness to ensure these values are effectively integrated into daily life (Putra et al., 2024). This readiness is reflected in their attitude and motivation during learning (Fortuna et al., 2024). Attitude and motivation to learn are two psychological factors that significantly influence the success of the learning process (Bandhu et al., 2024; Potvin & Hasni, 2014). In Islamic education, these attitudes and motivations are essential since this course is often considered an additional or secondary subject compared to engineering courses which are considered primary by most engineering students.

The theory used in this study is based on McClelland's theory of motivation (McClelland, 1987) which states that motives arise from redintegration, which involves reactivating previously experienced emotions (Aziz et al., 2023; Hadiastuti et al., 2024). In other words, motives emerge from learned considerations and are characterised by changes in the affective situation. According to the functional theory of Katz (1960),

DOI: https://doi.org/10.35723/ajie.v8i3.670

e-ISSN: 2599-3046 (online) | Volume 8, Issue 3 | July - September 2024
p-ISSN: 2657-1781 (print)

one must start from the basis of motivation to understand how attitudes accept or reject change. This motivation is a function of the individual's attitude toward change which is realised through learning outcomes. This aligns with Gagne's learning theory which states that attitudes are evaluative responses, which can be positive or negative towards psychological objects (Gagné, 1985). This study also uses Skiner's behavioural theory that attitude reinforcement consists of (1) positive reinforcement, namely any stimulus whose presence can strengthen the response given, and (2) negative reinforcement, including all stimuli that are removed to strengthen the response given (Skinner, 1963).

Previous studies show that a positive attitude towards Islamic education can improve students' understanding and practical implementation in their daily lives (Ilham et al., 2023; Mansur et al., 2023). A good attitude towards Islamic education allows students to be more open and receptive to the material taught to internalise Islamic values more effectively (Khazhymurat et al., 2023; Shaker et al., 2023). Therefore, hypothesis H1 was established that attitude significantly affects comprehension of Islamic education. A positive attitude towards certain subjects can increase interest and active participation in learning. Meanwhile, high learning motivation can encourage students to try harder and be more persistent in achieving their academic goals (Ajzen & Fishbein, 1977; Harmon-Jones & Harmon-Jones, 2021; Tambunan et al., 2024). Hence, hypothesis H2 was established that attitude significantly affects motivation to learn. Students with high learning motivation tend to be more enthusiastic about attending lectures, doing assignments, and looking for additional material outside the classroom. So they can achieve a deeper understanding of Islamic education (Sun, 2024; Torbergsen et al., 2023; Yeung, 2022). Therefore, hypothesis H3 is established that motivation to learn significantly affects comprehension of Islamic education.

However, in the context of Muslim engineering students, a positive attitude may not be enough to ensure a deep understanding (Rahmayani & Istiyono, 2022; Wicaksono & Korom, 2023; Zhu et al., 2019). This is where the role of learning motivation as a mediating factor becomes essential. Learning motivation is an internal drive that encourages a person to achieve academic goals (Bandhu et al., 2024; Berdida, 2023; Ilishkina et al., 2022). In Islamic education, learning motivation can act as a mediating factor that links positive attitudes towards the course with better understanding.

Although some studies explore the relationship between learning attitudes, motivation, and Islamic education comprehension, most focus solely on students in social and humanities majors and examine the antecedent separately. Studies on Muslim engineering students in the context of Islamic education as MKU and involving the motivation to learn as mediator antecedents are less discussed. This creates a significant knowledge gap, given that Muslim engineering students' characteristics and learning needs are unique and differ from those of other majors. Understanding the antecedents of comprehension is crucial for enhancing learning outcomes among students. This study aims to fill the gap by exploring how attitudes and motivation to learn affect Islamic education comprehension as MKU among Muslim engineering students and identifying strategies to improve the effectiveness of teaching Islamic education in this context.

Furthermore, this study will provide insight into how Islamic education is important to build students' character and personality. Thus, this study aims to analyse how attitudes and motivation to learn influence Islamic education comprehension among Muslim engineering students.

DOI: https://doi.org/10.35723/ajie.v8i3.670

II. METHOD

This study is a survey study using a quantitative method. A survey study was chosen for this study due to its various advantages, strengths and benefits compared to other methods (Kalton & Moser, 1985). It also provides a general capability to represent a large population including Higher Education Institutions (750 respondents). Due to the significant number of respondents, the data being gathered better describe the relative characteristics of the general population involved (Matos et al., 2023). Because of the high representativeness of the survey method, it is often easier to find statistically significant results than other data-gathering methods. It is also appropriate for this study because it enables data collection from large samples and populations effectively.

This study used the Krijcie and Morgan method to determine the size of the samples. Thus, this study was conducted on 254 students from Higher Education Institutions in West Sumatera, Indonesia as samples from 750 students. Samples were chosen purposively consisting of first-year and final-year Muslim engineering students. Islamic education comprehension covers human and religion (manusia dan agama), source of Islamic education (sumber ajaran Islam), aqidah, akhlak, thaharah, salat, syariah, al-faraid, Islam and science.

A questionnaire was prepared to collect the data. The questionnaire used 6-point Likert-type scales, a widely used method in survey research, including 1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 4 (slightly agree), 5 (agree), and 6 (strongly agree) toward each item of the questionnaire. All items are positive statements. The attitude indicators are cognitive, affective, and conative, as adapted from Wicaksono & Korom (2023). Indicators of motivation to learn are passion, encouragement, aspiration, appreciation, exciting activities, and a conducive environment adapted from Sunardi (2021). Indicators of Islamic education comprehension are belief, ritualistic, knowledge, and consequences adapted from (Juanda et al., 2024).

For some reason, the data are analysed by SmartPLS 3.0, a powerful tool for structural equation modelling (SEM) analysis (Ramayah et al., 2016). It is possible to create measurement models with predictive capabilities. A large number of samples does not need normal distribution. Its SEM analysis investigates empirical data using mediating elements, which provides a causal explanation for the model. This study employed path analysis to test hypotheses and identify unmediated and mediated relationships between exogenous and endogenous components. Two-tailed tests with a 5% probability were used. The mediating effect was evaluated using a significant value less than 0.05 ($p<0.05$).

III. RESULT AND DISCUSSION

Validity Test

The main focus of the Measurement Model Assessment (MMA) is analyses of indicators or statement items concerning latent variables that correspond to those variables. Convergent and discriminant validity tests were performed to ascertain whether these latent variables are consistent and possess an independent identity. The word "convergent validity" refers to evaluating the degree of agreement between two data. It is determined if the measurement items for specific variables meet the four established

DOI: https://doi.org/10.35723/ajie.v8i3.670

e-ISSN: 2599-3046 (online) | Volume 8, Issue 3 | July - September 2024
p-ISSN: 2657-1781 (print)

criteria. The item's validity is established when the outer loading is more than 0.7. The data are credible if the Average Variance Extracted (AVE) is more than 0.5 and the Cronbach's alpha value is more significant than 0.7. The results of the validity test are provided in Table 1 and Table 2.

Table 1. Validity of items

Predictor	Item	Outer Loading >0.7	Cronbach Alpha	CR	AVE
Attitude (X)	X1.1	0.834	0.939	0.949	0.675
	X1.2	0.826			
	X1.3	0.859			
	X1.4	0.884			
	X1.5	0.730			
	X1.6	0.823			
	X1.7	0.834			
	X1.8	0.873			
	X1.9	0.713			
Motivation to learn (Z)	Z1.1	0.903	0.941	0.950	0.733
	Z1.2	0.800			
	Z1.3	0.921			
	Z1.4	0.791			
	Z1.5	0.773			
	Z1.6	0.919			
	Z1.7	0.872			
Islamic education comprehension (Y) Y1.9 and Y1.12 deleted	Y1.1	0.883	0.976	0.978	0.736
	Y1.2	0.822			
	Y1.3	0.934			
	Y1.4	0.922			
	Y1.5	0.919			
	Y1.6	0.843			
	Y1.7	0.798			
	Y1.8	0.738			
	Y1.9	0.318			
	Y1.10	0.923			
	Y1.11	0.907			
	Y1.12	0.326			
	Y1.13	0.733			
	Y1.14	0.869			
	Y1.15	0.866			
	Y1.16	0.903			
	Y1.17	0.843			
	Y1.18	0.787			

Table 2. Fornell-larcker criterion

	X	Y	Z
X	0.822		
Y	0.505	0.858	
Z	0.615	0.597	0.856

The findings from the validity test shown in Tables 1 and 2 indicate that all items related to predictors' attitudes (X) and motivation to learn (Z) are valid. Meanwhile, two items (Y1.9 and Y1.12) of predictor Islamic education comprehension need to meet the validity. Thus, those two items are deleted from the construct model as presented in Figure 1. The results from the validity test and Fornell-Larcker criterion meet the criteria

DOI: https://doi.org/10.35723/ajie.v8i3.670

necessary for conducting structural equation modelling (SEM) analysis. Those ensure that MMA is valid, reliable and consistent.

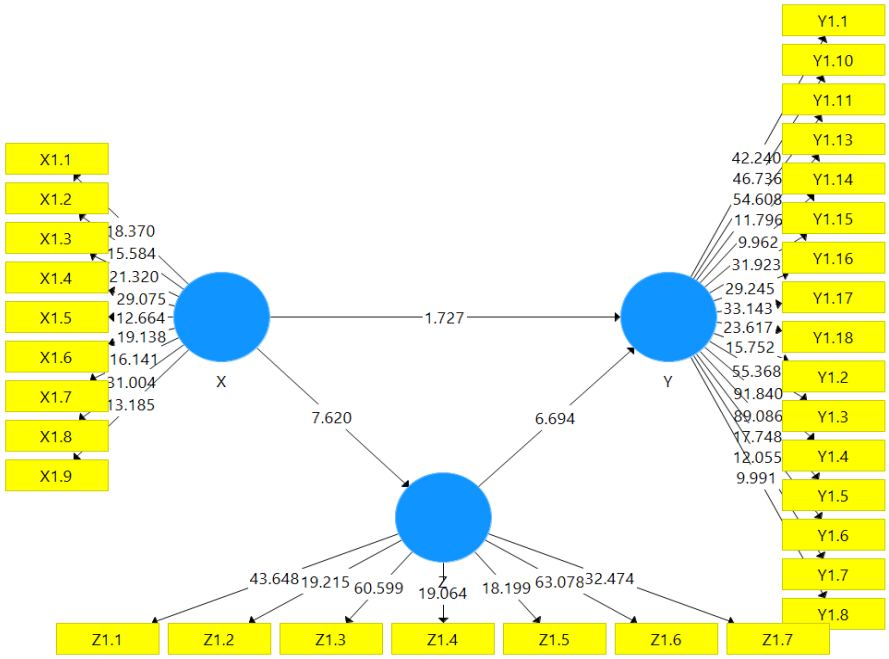

Figure 1. *Structural model*

Hypotheses

After MMA, path analysis is performed to examine whether the hypothesis is rejected or accepted. The summary of the path analysis of the structural model is shown in Table 3.

Table 3. Summary of structural model

Hypothesis	β	t	ρ	Results
(H1) X→Y	0.221	1.727	0.085	Rejected
(H2) X→Z	0.615	7.620	0.000	Accepted
(H3) Z→Y	0.461	6.694	0.000	Accepted
X→Z→Y	0.284	5.071	0.000	Accepted

As depicted in Table 3, each hypothesis that shows a correlation or effect between variables has been answered. From β, the correlation between attitude (X) and Islamic education comprehension (Y) is positive (β=0.221). It means the better the student's attitude, the better his understanding of Islamic education. However, the hypothesis H1 test got a significant value of 0.085. It is more than 0.05 (p>0.05) and t is 1.727, thus hypothesis H1 is rejected. This means that attitude does not significantly affect comprehension of Islamic education directly.

The hypothesis H2 test got a significant value of 0.000. It is less than 0.05 (p<0.05) and t is 7.620, thus hypothesis H2 is accepted. This means that attitude significantly affects motivation to learn. From β, the correlation between attitude (X) and motivation to learn (Z) is positive (β=0.615). This means that a better attitude in students leads to improved motivation to learn.

The hypothesis H3 test got a significant value of 0.000. It is less than 0.05 (p<0.05) and t is 6.694, thus hypothesis H3 is accepted. This means that motivation to learn significantly affects comprehension of Islamic education. From β, the correlation

DOI: https://doi.org/10.35723/ajie.v8i3.670

e-ISSN: 2599-3046 (online) | Volume 8, Issue 3 | July - September 2024
p-ISSN: 2657-1781 (print)

between motivation to learn (Z) and Islamic education comprehension (Y) is positive (β=0.461). This means that better students' motivation to learn leads to better students' understanding.

As a mediator in the relationship between attitude and Islamic education comprehension, the role of motivation is shown by a significant value. The significance value is less than 0.05 ($p<0.05$) and t is 5.071. This indicates that motivation to learn significantly mediates the relationship between attitude and comprehension of Islamic education. From β, the correlation is positive (β=0.284). It means that the better students' motivation to learn fosters the effect of attitude on Islamic education comprehension.

Effects of Attitude and Motivation to Learn as Antecedent Factors

Even though attitudes towards learning do not significantly influence students' comprehension, they play a crucial role in influencing learning motivation. This motivation, in turn, influences learning and understanding (Fadri et al., 2023; Tambunan et al., 2024). Positive attitudes towards learning, such as enthusiasm, interest, and self-confidence, can increase intrinsic and extrinsic motivation. Students with positive attitudes tend to be more motivated to attend lectures, actively participate in discussions, and complete assignments (Hafis et al., 2023). This high motivation encourages students to adopt more effective learning strategies, such as managing time effectively, seeking additional learning resources, and applying in-depth learning techniques (Brändle et al., 2023). This aligns with Gagne's theory, which posits that attitude is an evaluative response that can be positive or negative toward psychological objects. Similarly, based on the Functional Theory Katz (1960), "To understand how attitudes accept and reject change, one must start from the basis of motivation which is a function of attitudes for students who want to increase their comprehension in learning subjects".

High learning motivation also encourages active involvement in the learning process which is essential for understanding the subject. When students are motivated they are more likely to ask questions, discuss, and seek clarification on concepts they do not understand. This active engagement allows students to overcome confusion and deepen their understanding of the material. High motivation encourages students to be more diligent and persistent in facing learning challenges so they do not give up easily when facing difficulties. This persistence is essential for a more comprehensive and in-depth understanding (Uslu & Durak, 2022).

Empirical study supports this result by showing a strong relationship between motivation to learn and comprehension. High learning motivation correlates with the use of more effective learning strategies and better academic outcomes (Held & Mejeh, 2024). Motivated students often use deep learning techniques, which involve understanding the material in a comprehensive and integrated manner, manage their time well, and are better at problem-solving. In other words, although attitudes towards learning do not directly influence students' understanding of learning, these attitudes through learning motivation can indirectly influence students' understanding of learning (Sunardi, 2021).

The importance of learning motivation shows that efforts to improve students' understanding of learning must be focused on increasing motivation through improving attitudes (Allen et al., 2023). For example, lecturers can use exciting and relevant teaching methods to increase student interest and enthusiasm. Providing constructive and motivating feedback can also enhance learning motivation. Additionally, creating a

DOI: https://doi.org/10.35723/ajie.v8i3.670

supportive learning environment where students feel valued and motivated to learn can increase their positive attitudes towards learning and, ultimately, their motivation and understanding (Liu, 2023).

Based on functional theory (Functional Theory), Katz said "To understand how attitudes accept and reject change, one must start from the basis of motivation which is a function of attitudes for humans who want change in the form of learning outcomes." this shows that efforts to change attitudes need to be linked to the needs and desires of the people whose attitudes will be changed. This aligns with Gagne's theory that attitude is an evaluative response that can be positive or negative toward psychological objects.

In general, if students have attitudes towards a field of study that are either positive or negative, students will tend to react which shows the 3 attitudes they have (Brändle et al., 2023). In this case, attitudes need to be reinforced, according to Skiner's theory, reinforcement consists of 1) positive reinforcement, including any stimulus whose presence can strengthen the response given, and 2) negative reinforcement, including all stimuli that are removed to strengthen the response. Motivation has a crucial role in understanding and explaining individual behaviour during the learning process in learning activities. In terms of giving motivation, it is adjusted to certain conditions so that if someone does something and doesn't like it, he will try to eliminate or avoid that feeling of dislike. So it can stimulate motivation by external and internal factors that grow within a student. Students who have strong motivation will have a lot of energy to carry out learning activities, but this must be accompanied by their interest in the lessons given to them by the lecturer (Bandhu et al., 2024). Learning achievement will be optimal when given the right motivation (Tambunan et al., 2024).

This study is closely related to the theory of David McClelland, which argues that A motive is a redintegration by a cue of a change in an affective situation, which means that a motive is an implication of the results of considerations that have been studied (redintegration) indicated by a change in the situation effective. The source of motives is stimulation, so changes occur in affective differences when motives emerge in achieving the expected achievement. Thus, this study aligns with previous studies (Berdida, 2023). Students' learning motivation will improve their comprehension.

IV. CONCLUSION

Attitude insignificantly affects Islamic education comprehension. Meanwhile, attitude significantly affects motivation to learn. Motivation to learn significantly affects Islamic education comprehension and significantly mediates between attitude and Islamic education comprehension. Since attitude insignificantly affects comprehension without motivation, lecturers should focus on enhancing motivation to learn among students. Attitudes towards learning have an important, although indirectly impact on students' understanding of learning. A positive attitude increases learning motivation, and high learning motivation facilitates active engagement, persistence, and implementation of effective learning strategies, which contribute to a better understanding of the material. Thus, efforts to improve learning understanding must include strategies in learning attitudes to increase student learning motivation. The results of this study provide practical recommendations for educators and managers of engineering study programs in designing and implementing more effective Islamic education programs as MKU. Furthermore, this study can be the basis for further, deeper and more comprehensive studies regarding Islamic education among engineering students. It is expected to

DOI: https://doi.org/10.35723/ajie.v8i3.670

enhance the quality of Islamic education as part of the curriculum in tertiary institutions, particularly in engineering programs, thereby producing graduates with skills who possess strong moral integrity and are ready to tackle global challenges based on Islamic values.

V. ACKNOWLEDGEMENTS

The authors would like to thank the higher education institutions in West Sumatera and the lecturer in English Language Education at Universitas Negeri Padang for supporting this study.

VI. REFERENCES

[1] Abdullah, M. A. (2017). Islamic Studies in Higher Education in Indonesia: Challenges, Impact and Prospects for the World Community. *Al-Jami'ah: Journal of Islamic Studies*, *55*(2), 391–426. https://doi.org/10.14421/ajis.2017.552.391-426

[2] Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, *84*(5), 888–918. https://doi.org/10.1037/0033-2909.84.5.888

[3] Allen, E. C., Masonheimer, A. T., & Wolters, C. A. (2023). Do dispositional motivational beliefs predict self-regulated learning strategies? An examination of willpower beliefs. *International Journal of Educational Research*, *119*, 102174. https://doi.org/10.1016/j.ijer.2023.102174

[4] Aziz, W. A., Wulansari, R. E., Putra, R. P., Tun, H. M., Tin, C. T., & Ya, K. Z. (2023). Project-based learning module on creativity and entrepreneurship product subjects: Validity and empirical effect. *Jurnal Pendidikan Teknologi Kejuruan*, *6*(3), 216–227. https://doi.org/10.24036/jptk.v6i3.34323

[5] Bandhu, D., Mohan, M. M., Nittala, N. A. P., Jadhav, P., Bhadauria, A., & Saxena, K. K. (2024). Theories of motivation: A comprehensive analysis of human behavior drivers. *Acta Psychologica*, *244*, 104177. https://doi.org/10.1016/j.actpsy.2024.104177

[6] Berdida, D. J. E. (2023). Resilience and academic motivation's mediation effects in nursing students' academic stress and self-directed learning: A multicenter cross-sectional study. *Nurse Education in Practice*, *69*, 103639. https://doi.org/10.1016/j.nepr.2023.103639

[7] Brändle, M., Sotiriadou, C., & Zinn, B. (2023). Self-assessments, attitudes, and motivational orientations towards the use of digital media in teaching a comparison between student teachers of different subject clusters. *Heliyon*, *9*(9). https://doi.org/10.1016/j.heliyon.2023.e19516

[8] Fadri, M. Al, A, Y., Fernanda, Y., & Prasetya, F. (2023). Optimizing student learning in Computer Numerical Control subject: A comprehensive analysis of influential

factors. *Journal of Engineering Researcher and Lecturer*, *2*(3), 112–119. https://doi.org/10.58712/jerel.v2i3.114

[9] Fortuna, A., Prasetya, F., García, J. L. C., Arcelus-Ulibarrena, J. M., Salman, A., Karimi, A., & Yusuf, A. (2024). Modern learning paradigms: A bibliometric analysis of augmented reality and virtual reality in vocational education. *Jurnal Pendidikan Teknologi Kejuruan*, *7*(2), 91–114. https://doi.org/10.24036/jptk.v7i2.36523

[10] Gagné, E. D. (1985). *The cognitive psychology of school learning*. Amerika: Little, Brown and Company.

[11] Hadiastuti, Ernawati, & Suci, P. H. (2024). Analysis of student learning outcomes through the task learning approach toward cash pattern construction course. *Jurnal Pendidikan Teknologi Kejuruan*, *7*(1), 1–10. https://doi.org/10.24036/jptk.v7i1.30223

[12] Hafis, M., Syahril, S., Refdinal, R., & Prasetya, F. (2023). Optimizing learning engagement and performance in technical education: Harnessing the power of video tutorials for enhanced motivation and skill development in Shield Metal Arc Welding Subject. *Journal of Engineering Researcher and Lecturer*, *2*(3), 120–128. https://doi.org/10.58712/jerel.v2i3.112

[13] Harmon-Jones, E., & Harmon-Jones, C. (2021). On defining positive affect (PA): considering attitudes toward emotions, measures of PA, and approach motivation. *Current Opinion in Behavioral Sciences*, *39*, 46–51. https://doi.org/10.1016/j.cobeha.2021.01.008

[14] Held, T., & Mejeh, M. (2024). Students’ motivational trajectories in vocational education: Effects of a self-regulated learning environment. *Heliyon*, *10*(8). https://doi.org/10.1016/j.heliyon.2024.e29526

[15] Ilham, D., Asdiany, D., Zainuddin, A. H., K, N., Iksan, M., Santaria, R., & Alannasir, W. (2023). Caring Values in Islamic Religious and Moral Education on Merdeka Belajar Curriculum: A Study of Fifth-Grade Student and Teacher Books. *Al-Ishlah: Jurnal Pendidikan*, *15*(4), 4626–4639. https://doi.org/10.35445/alishlah.v15i4.3763

[16] Ilishkina, D. I., de Bruin, A., Podolskiy, A. I., Volk, M. I., & van Merriënboer, J. J. G. (2022). Understanding self-regulated learning through the lens of motivation: Motivational regulation strategies vary with students' motives. *International Journal of Educational Research*, *113*, 101956. https://doi.org/10.1016/j.ijer.2022.101956

[17] Juanda, A., Nurhayati, T., Nasrudin, D., & Muhtar, S. N. (2024). Assessing students' religious proficiency using Glock-Stark Dimensions and its impact on curriculum development and Islamic education learning. *Paedagogia*, *27*(2), 164–169. https://doi.org/10.20961/paedagogia.v27i2.84840

[18] Juhaidi, A., Syaifuddin, Salamah, Ma'ruf, H., Yuseran, M., Shapiah, Janah, R., Mudhiah, Saputri, R. A., Muharramah, N., Fuady, M. N., Ramadan, W., & Lisdariani, R. (2024). The effect of brand personality, brand-self congruity, and

brand love on E-WOM in Islamic higher education in Indonesia: A mediating effect of brand trust. *Social Sciences & Humanities Open*, *10*, 100955. https://doi.org/10.1016/j.ssaho.2024.100955

[19] Kalton, G., & Moser, C. A. (1985). *Survey Methods in Social Investigation*. Amerika: Better World Books.

[20] Katz, D. (1960). The functional approach to the study of attitudes. *The Public Opinion Quarterly*, *24*(2), 163–204. https://doi.org/10.1086/266945

[21] Khazhymurat, A., Paiyzkhan, M., Khriyenko, S., Seilova, S., Baisanova, S., Kuntuganova, A., Almazan, J. U., & Cruz, J. P. (2023). Health education competence: An investigation of the health education knowledge, skills and attitudes of nurses in Kazakhstan. *Nurse Education in Practice*, *68*, 103586. https://doi.org/10.1016/j.nepr.2023.103586

[22] Liu, Q. (2023). Information literacy and recent graduates: Motivation, self-efficacy, and perception of credit-based information literacy courses. *The Journal of Academic Librarianship*, *49*(3), 102682. https://doi.org/10.1016/j.acalib.2023.102682

[23] Mansur, Ikhsan, M., Kamaruddin, K., & Samsuri, S. (2023). Implementation of Islamic Education in Increasing the Religious Awareness of Senior High School Students. *Al-Ishlah: Jurnal Pendidikan*, *15*(3). https://doi.org/10.35445/alishlah.v15i3.4231

[24] Matos, J. F., Piedade, J., Freitas, A., Pedro, N., Dorotea, N., Pedro, A., & Galego, C. (2023). Teaching and Learning Research Methodologies in Education: A Systematic Literature Review. In *Education Sciences* (Vol. 13, Issue 2). https://doi.org/10.3390/educsci13020173

[25] McClelland, D. C. (1987). *Human motivation*. Britania Raya: Cambridge University Press.

[26] Parhan, M., Syahidin, S., Somad, M. A., Abdulah, M., & Nugraha, R. H. (2024). Developing a Contextual Learning Model in Islamic Education to Improve Applicable Knowledge and Foster Knowledge-Based Virtues. *Jurnal Pendidikan Islam*, *10*(1), 75–86. https://doi.org/10.15575/jpi.v10i1.35205

[27] Potvin, P., & Hasni, A. (2014). Interest, motivation and attitude towards science and technology at K-12 levels: a systematic review of 12 years of educational research. *Studies in Science Education*, *50*(1), 85–129. https://doi.org/10.1080/03057267.2014.881626

[28] Putra, R. E., Indrawan, E., & Fortuna, A. (2024). Effect of implementing demonstration method on students' understanding and practical skills in Milling Machining Course. *Journal of Engineering Researcher and Lecturer*, *3*(1), 35–45. https://doi.org/10.58712/jerel.v3i1.125

[29] Rahmayani, F., & Istiyono, E. (2022). Affective Assesment Instrument to Assess Student Attitudes Towards Science, Technology, Engineering and Mathematics.

Journal of Education Research and Evaluation, *6*(4), 637–644. https://doi.org/10.23887/jere.v6i4.47681

[30] Ramayah, T., Cheah, J.-H., Chuah, F., Ting, H., & Memon, M. (2016). *Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3.0: An Updated and Practical Guide to Statistical Analysis*. Pearson Malaysia.

[31] Saada, N. (2023). Educating for global citizenship in religious education: Islamic perspective. *International Journal of Educational Development*, *103*, 102894. https://doi.org/10.1016/j.ijedudev.2023.102894

[32] Shaker, L., Amilcar, C., Kothari, N., & Murano, T. (2023). Knowledge, attitudes and perceptions of remediation among trainees in graduate medical education programs. *Journal of Emergency Medicine*, *65*(1), e41–e49. https://doi.org/10.1016/j.jemermed.2023.04.008

[33] Skinner, B. F. (1963). Operant behavior. *American Psychologist*, *18*(8), 503–515. https://doi.org/10.1037/h0045185

[34] Sun, X. (2024). How the level of student research autonomy in higher education affects learning efficiency by shaping motivation: A case of instructional disconformity. *Learning and Motivation*, *87*, 102016. https://doi.org/10.1016/j.lmot.2024.102016

[35] Sunardi, A. I. (2021). Student Motivation in Online English Learning. *ELE Reviews: English Language Education Reviews*, *1*(2), 110–124. https://doi.org/10.22515/ele-reviews.v1i2.4034

[36] Suyadi, Nuryana, Z., Sutrisno, & Baidi. (2022). Academic reform and sustainability of Islamic higher education in Indonesia. *International Journal of Educational Development*, *89*, 102534. https://doi.org/10.1016/J.IJEDUDEV.2021.102534

[37] Tambunan, D., Tambun, Y., & Harahap, S. (2024). Motivation and attitude of English language learning among nursing students. *Malahayati International Journal of Nursing and Health Science*, *6*(7), 545–553. https://doi.org/10.33024/minh.v6i7.13253

[38] Torbergsen, H., Utvær, B. K., & Haugan, G. (2023). Nursing students' perceived autonomy-support by teachers affects their intrinsic motivation, study effort, and perceived learning outcomes. *Learning and Motivation*, *81*, 101856. https://doi.org/10.1016/j.lmot.2022.101856

[39] Uslu, N. A., & Durak, H. Y. (2022). Predicting learner autonomy in collaborative learning: The role of group metacognition and motivational regulation strategies. *Learning and Motivation*, *78*, 101804. https://doi.org/10.1016/j.lmot.2022.101804

[40] Wicaksono, A. G. C., & Korom, E. (2023). Attitudes towards science in higher education: Validation of questionnaire among science teacher candidates and engineering students in Indonesia. *Heliyon*, *9*(9), e20023. https://doi.org/10.1016/j.heliyon.2023.e20023

e-ISSN: 2599-3046 (online) | Volume 8, Issue 3 | July - September 2024
p-ISSN: 2657-1781 (print)

[41] Yeung, P. (2022). A model of Chinese reading comprehension: The role of cognition and motivation. *Learning and Individual Differences*, *99*, 102202. https://doi.org/10.1016/j.lindif.2022.102202

[42] Zhu, J., Chen, J., McNeill, N., Zheng, T., Liu, Q., Chen, B., & Cai, J. (2019). Mapping Engineering Students' Learning Outcomes From International Experiences: Designing an Instrument to Measure Attainment of Knowledge, Skills, and Attitudes. *IEEE Transactions on Education*, *62*(2), 108–118. https://doi.org/10.1109/TE.2018.2868721

DOI: https://doi.org/10.35723/ajie.v8i3.670