Effective learning environment towards learning agility: student's attitude as mediator

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ABSTRACT

An effective learning environment, characterized by student-centered teaching methods, access to resources, and a supportive atmosphere, is frequently seen as a catalyst for fostering this agility. The role of students' attitudes, such as motivation, openness to change, and engagement, can significantly impact learning agility among students. This research employs a survey methodology to examine the various elements of a learning environment and their impact on students' agility in learning, focusing on a sample of 323 students from private universities in Selangor. The analysis also explores the extent to which students' attitudes influence this relationship, either enhancing or diminishing the effect of the learning environment on agility. Data collection was conducted via surveys administered to university students, followed by structural equation modeling analysis. The findings indicate that an effective learning environment positively correlates with learning agility, and this relationship is notably enhanced when students demonstrate a positive attitude toward learning. Curiosity, resilience, and a growth mindset are essential elements in optimizing the advantages of an effective learning environment. The study's implications underscore the importance of educators considering student attitudes when creating learning environments intended to cultivate agile, adaptive learners.

1. Introduction

Malaysia's development plan strongly emphasizes education, aiming to give students the skills and information they need to advance both personally and as a country. The Ministry of Education oversees the Malaysian educational system's pre-primary, primary, secondary, and postsecondary phases. This system offers a range of courses to accommodate different learning needs and consists of public and private institutions. Since gaining independence in 1957, science, technology, engineering, and math (STEM) education has been a top priority in Malaysia's educational system (Azhar et al., 2024). There was a colonial

feel to the previous system. The Education Blueprint 2013–2025 delineates Malaysia's objectives to enhance the caliber of education and generate graduates capable of competing on a global scale.

The ability and desire to adapt knowledge from experiences to succeed in novel circumstances is known as learning agility. Its four main dimensions are People, outcomes, mental agility, and change agility. Learning agility is vital to education because it fosters the critical thinking and problem-solving skills that students need to effectively traverse complex and dynamic settings (Vadakalu Elumalai et al., 2020). The educational system ensures that students are prepared for lifelong learning and situations by encouraging learning agility.

Learning agility takes the form of people agility (managing relationships with others), outcomes agility (reaching goals under challenging circumstances), and mental agility (critical and creative thinking) (Mohd Satar et al., 2021). These types of agility support kids' success and adaptation in various contexts. Education and learning agility have significantly been impacted by digitization, which has changed traditional teaching techniques through digital resources, online learning, and virtual classrooms, increasing accessibility and flexibility in education. However, digitalization also brings drawbacks, including the digital divide, diversions, and the requirement for digital content quality management (Slavin, 1978). Currently, in Malaysia, most education institutes, which mainly consist of public universities and schools, are still in the standard of IR 3.0 with traditional teaching. At the same time, most of the world has already begun implementing IR 4.0 in major universities and schools. This issue was exposed during the recent pandemic, which forced the country's education sector to implement online learning (Rasiah et al., 2023). The rapid jump in teaching style and digitalization caused enormous problems for students, lecturers and the government. This also reveals another significant issue. This is a need for digital literacy among teachers and students. Also, the education sector needs more direction to overcome this gap. Thus, becomes an essential purpose of this research. Private universities have implemented online learning post-pandemic, slowly drifting away from the physical classroom (Nathan, 2019). Shifting to remote learning.

While private and public universities within cities were quickly closing the gap in digital infrastructure, there were other issues the education sector must overcome. That is the need for soft skills among graduate students. At the same time, most graduates have acquired knowledge that meets industry standards. Current IR 4.0 companies prefer graduates with soft skills. These skills include creativity and communication (Nathan, 2019). This is further supported by Singh (2019), stating that even though Malaysian students received 12 years of education, 3 of those years did not contribute to helpful education, and these students only achieved 62% of their maximum potential. Therefore, this study aims to investigate the significant influence of information, communication, and creation skills on learning agility among students in private universities in Selangor with the mediating effect of positive student attitudes.

2. Literature review

2.1 Learning agility

Learning agility is when an individual can change their behavior based on new experiences and how easily they can adapt from one idea to another (Haring et al., 2013). Additionally, it is the development of current and long-term potential. Similarly, it can be described as skills acquired by individuals 's willingness to learn, openness, and flexibility (Silalahi et al., 2020). Over time, the significance of learning agility has become more relevant. Mainly for 2 main reasons. The first reason is the rapid growth of technology in IR 4.0. This causes individuals to adapt rapidly to changes in the environment. Those unable to adapt, unfortunately, will be left out. The second reason is globalization. Education is no longer restricted to individual countries. Nowadays, more international courses and classes are being taken across the entire world. This pushes individuals, mainly students, to improve their soft skills to further distinguish themselves from their global competition (Ismail et al., 2024). These skills include analytics and problem-solving skills (Henriksen et al., 2021)

2.2   Communication skills

The interactions between two individuals for exchanging views and information are known as communication (Reith-Hall & Montgomery, 2023). It is Used to express an individual's desire to achieve their goals, including affection, cognition, and perception (Hargie, 2006). So, communication skills are known as the ability to receive, convey, and process information through non-verbal or verbal communication (van Laar et al., 2020). In the workforce, it is essential for employees to effectively communicate with their peers by using social networking sites, messaging services, and email (van Deursen & van Dijk, 2015). Furthermore, due to globalization, employers expect their workers to have good communication skills (Autor et al., 2003). Moreover, according to most scholars' communication skills have a strong relationship with learning agility (Henriksen et al., 2021; Tang et al., 2017; van Laar et al., 2020). Thus, the reason is that it is significant for students to develop communication skills.

2.3   Information skills

Information skills are defined as the information gained from collecting, organizing, and evaluating multiple sources (Silva, 2009). Moreover, this includes the ability for individuals to recognize reliable information from a vast array of data (Marchionini & White, 2007). Among information skills, one essential skill includes literary skills (van Laar et al., 2020). They are reading skills, analyzing, and, in recent days, gaining knowledge on digitalization. Information skills that employers currently desire it are self-directed learning, critical skills, and the ability to work. This is further supported by Ismail et al. (2024), which states that study skills (information) and learning agility have significant relationships.

2.4   Creation skills

Creativity or creation skills is an individual's ability to utilize their artistic expressions to solve problems in social, sustainable, and economic problems (Henriksen et al., 2021). Moreover, creativity is also involved in processing knowledge gained by the individual to create new ideas to solve complex problems (Tang et al., 2017). In the current complex environment of the workplace, a student's creativity plays an essential role in their career progression (Maria et al., 2018). This is further supported by some scholars, such as Ismail et al. (2024), mentioning that students' creativity does impact their learning agility

2.5   Student's attitude

Student attitude is the positive and negative emotions felt when learning, interacting, and experiencing during studiess (van Laar et al., 2020). This includes changes in behavior towards colleagues and lectures. According to Reith-Hall & Montgomery (2023), a student's attitude in studying extensively impacts learning agility, information skills, and communication skills. This is further supported by Tan et al. (2017), who state that student motivation (attitude) plays a vital role in creativity skills. Figure 1 illustrates that multiple articles used student attitudes as a mediator or in direct relationships with diverse outcomes.
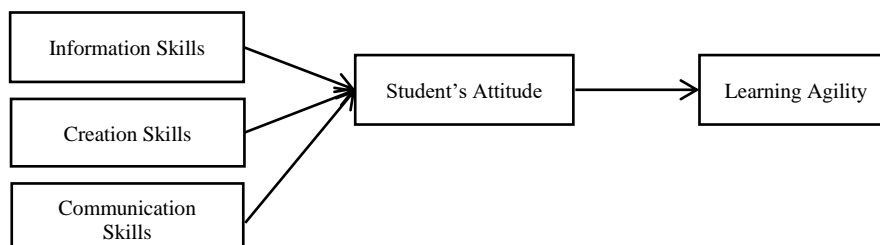

Figure 1. Conceptual framework effective learning environment towards learning agility: student's attitude as mediator

3. Methodology

There were 323 students from private universities in Selangor who participated in response to the survey on communication skills, information skills, and creation skills that have a relationship with learning agility while attitude as a mediator. A convenience sampling method was applied, and all survey items were adapted from previous scholars in similar research areas. Most students have their own intention to learn new things, and female students were found to have a higher mean score for learning agility than male students. This suggested that female students have a higher inclination for adaptive learning compared to male students. Out of these 323 samples, the majority (99.7%) were aged between 20-25 years, indicating the majority of advanced students are below 25 years. Also, there were no major differences in significant levels of learning agility based on age.

Moreover, most (87.9%) of students reported no significant working experience. This suggested that the sampled students were mainly full-time students focusing on their studies. Additionally, these students were all in their fourth semester (SEM4), suggesting these students have consistent academic backgrounds.

4. Findings

4.1 Measurement model assessment

When assessing the indicator reliability (outer loading), the set of indicators is consistent with what it intends to measure (Urbach & Ahlemann, 2010). The value of outer loading should be equal to and greater than 0.5, which is acceptable. As shown in Table 1, all the factors loading for the constructs were greater than 0.5 and concluded that all items were acceptable for reliability. Next is the assessment of convergent validity, which is when individual indicators reflect a construct known as average variance extracted. In order to achieve adequate convergent validity, each construct should account for at least 50 percent of the variance in the assigned indicators (AVE > 0.50). It was established that the Average Variance Extracted (AVE) values were examined for each convergent validity construction. With all the AVE values greater than 0.5 (Information Skill = 0.704, Communication Skill = 0.828, Creation Skill = 0.883, Learning Agility = 0.854, Attitude = 0.845), it is indicated that more than half of the variance of the indicators were explained by the construction of reliability and validity.

Table 1: Convergent validity assessment

Constructs	Factor loading	Composite reliability (CR)	Average variance extracted (AVE)
Attitude		0.956	0.845
ATT1	0.924		
ATT2	0.933		
ATT3	0.922		
ATT4	0.897		
Communication Skill		0.960	0.828
COMSKILLS1	0.898		
COMSKILLS2	0.933		
COMSKILLS3	0.914		
COMSKILLS4	0.921		
COMSKILLS5	0.883		
Creation skills		0.958	0.883
CREATESKILLS1	0.931		
CREATESKILLS2	0.941		
CREATESKILLS3	0.947		
Information Skills		0.969	0.704
INFOSKILL1	0.682		
INFOSKILL2	0.784		
INFOSKILL3	0.828		
INFOSKILL4	0.813		
INFOSKILL5	0.823		
INFOSKILL6	0.805		
INFOSKILL7	0.859		
INFOSKILL8	0.908		
INFOSKILL9	0.879		
INFOSKILL10	0.876		
Learning Agility		0.967	0.854
LEARNA1	0.920		
LEARNA2	0.938		
LEARNA3	0.942		
LEARNA4	0.898		
LEARNA5	0.923		

The assessment applied the Heterotrait-Monotrait Ratio of Correlation (HTMT) for discriminant validity, which refers to the correlation ratio within the constructs to correlations between the constructs. The HTMT value should be greater than 0.85 or 0.90 when using this assessment (Ringle, Sarstedt, Sinkovics & Sinkovics, 2023). The result in Table 2 shows there are no issues with discriminant as the values meet the threshold values.

Table 2: Discriminant Validity

Constructs	1	2	3	4
Attitude				
Communication Skill	0.668			
Creation skills	0.577	0.900		
Information Skills	0.708	0.890	0.813	
Learning Agility	0.865	0.799	0.717	0.817

4.2 Structural model

The R-square (R^2) values mean the contribution level of variance in the dependent variable being explained by the independent variables. There is a 0.64 R^2 value by Learning Agility, indicating that 64% of the variance in learning agility is related to the combined effects of information skill, communication skill, creation skill, and attitude. The following, 55% of the variance in attitude also explains the independent variables in the model. In this analysis, path coefficients have indicated the strength and significance of the direct relationship between the variables. In testing the hypotheses, assessing the path coefficient presents the beta values; t-values should be greater than 1.96 for a significance level 0.05 in a two-tailed test. As shown in Table 3, the direct effect of attitude (β= 0.513, t-value= 5.966, $p<$ 0.05), communication (β= 0.181, t-value= 1.602, > 0.05), creation skills (β= 0.0653, t-value= 0.086, $p>$ 0.05), information (β=236, t-value= 2.309, $p<$ 0.05) indicates that attitude and information skills have significance influence on learning agility. Hence, hypothesis 2 was supported and contrasted with hypothesis 1, and hypothesis 3 was not supported.

Meanwhile, assessing mediation of attitude found that attitude mediates the relationship between information skills and learning agility (β= 0.264, t-value= 3.2896, $p<$ 0.05). Therefore, hypothesis 6 was supported, and the student's attitude did not mediate the relationship between communication skills and creation skills, so there was no significant influence on learning agility. Hypotheses 4 and 5 were not supported.

5. Discussion

Information, communication, and creation are essential and specific skills that enhance learning agility (Eichinger & Lombardo, 2004). Students with information skills can effectively locate, evaluate, and utilize the source of information. Secondly, students with communication skills can exchange and facilitate the understanding of knowledge with peers, making value exchange. Thirdly, creation skills have allowed students to learn traditional methods and develop innovative solutions. Students with a collection of these skills are more likely to adapt and learn in rapidly changing and diverse situations.

Moreover, Attitude as a significant mediator has indicated that students with positive attitudes can significantly amplify the influence level of the collection of skills to learning effectiveness (learning agility) (Lee & Song, 2022). From the structure of the model, not only skill development but positive attitudes are also highlighted as critical factors towards learning agility. There are various strategies to foster positive attitudes in students' mindsets, such as providing a supportive learning environment and recognition of student achievements (Slavin, 1978).The significant indirect effect of information skills through attitude to learning agility has emphasized the crucial role of displaying a positive attitude among students. Therefore, policymakers should focus on creating educational strategies that support the informative learning environment and further promote positive attitudes among students. However, the non-significant direct and indirect effects of communication and creation skills on learning agility are less impactful than those of information skills. Therefore, these findings have highlighted two skills that do not significantly influence learning agility, which can be less prioritized.

6. **Implication**

The study's findings have significantly contributed to scholarly articles. This is done by improving the past literature related to learning agility and its factors, including information, communication, and creation skills. This finding also includes attitude as a mediator to determine the complex relationships between the variables. The current research has added to existing outcomes of attitudes significantly related to learning agility and information skills. In addition, attitudes have a mediating effect on the other two variables. The main limitation of this study is the small sample size of respondents, which consists of 325. It is necessary to have a pool of respondents as large as possible. This is because, in most research, the increase in the number of respondents also increases the relevancy and validity of the data. Another major limitation of this research is the need for more dimensions within the factors. For example, information skills can be divided into critical thinking, reading, and more. Another potential study approach could be the difference in educational level with each factor with attitude as a mediator.

7. **Conclusion**

The findings in the research have answered research questions and objectives. These findings have also contributed to scholarly articles. Furthermore, the research paper confirmed that information skills are significantly related to information skills and learning agility. Moreover, both variables are significant to attitude. Thus, the cause of the mediating effect of attitude on learning agility and information skills. However, within this study, some relationships shown to be strongly significant were outside this study. They are creation, communication skills, and attitude with learning agility, in addition to attitude being insignificant to both communication and creation skills. Based on this study, information skills are more crucial for a student to improve in their soft skills. Since student's attitudes do mediate, it indicates that for lectures, it is important for students to be interested and motivated during their classes to improve their learning agility. After discussing the findings, I found several suggestions and recommendations for future reference in enhancing learning agility among Malaysian students. Firstly, a skill development program should be prioritized, particularly in developing information, communication, and creation skills. Secondly, educational industries should always foster a positive and supportive learning environment for students to build positive attitudes in adaptive self-learning.

Moreover, as mentioned before, targeted interventions should be developed to support different demographic groups, ensuring every student enjoys an equal opportunity. Furthermore, Malaysia should emphasize the integration of digital literacy into the academic curriculum, motivating local students to catch up with foreign technology and cultivating talented people who can represent our country. Finally, all of these recommended policies are suggested with the condition of regular assessment and updates, aligning the education demands with the rapidly evolving landscape.

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Conflict of interest statement

This section is compulsory. The following is an example of a conflict-of-interest statement: The authors agree that this research was conducted in the absence of any self-benefits, commercial, or financial conflicts and declare the absence of conflicting interests with the funders.

References

Mettam, G. R., & Adams, L. B. (1994). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281-304). E-Publishing Inc.

Autor, D. H., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. The Quarterly Journal of Economics, 118(4), 1279–1333. https://doi.org/10.1162/003355303322552801

Azhar, Z., Jalaludin, D., Ghani, E. K., Ramayah, T., & Nelson, S. P. (2024). Learning agility quotient and work readiness of graduating accounting students: embracing the dynamics of IR4.0. Accounting Education, 33(4), 450–472. https://doi.org/10.1080/09639284.2023.2211567

Eichinger, R., & Lombardo, M. (2004). Learning Agility as a Prime Indicator of Potential. Human Res, 27(12).

Hargie, O. (2006). The Handbook of Communication Skills (4th ed.). Routledge.

Haring, S., Shankar, J., & Hofkes, M. K. (2013). The Potential of Learning Agility the Relationship between Learning Agility and Success Introduction 3.

Henriksen, D., Creely, E., Henderson, M., & Mishra, P. (2021). Creativity and technology in teaching and learning: a literature review of the uneasy implementation space. Educational Technology Research and Development, 69(4), 2091–2108. https://doi.org/10.1007/s11423-020-09912-z

Ismail, Z., Aziz, C. R., & Chea, C. C. (2024). Preparing Future-ready Learners: 21st Century Skills in an Open and Distance Learning Education in Malaysia. JPTJJ, 25(1), 27–40.

Lee, J., & Song, J. H. (2022). Developing a measurement of employee learning agility. European Journal of Training and Development, 46(5/6), 450–467. https://doi.org/10.1108/EJTD-01-2021-0018

Marchionini, G., & White, R. (2007). Find What You Need, Understand What You Find. International Journal of Human-Computer Interaction, 23(3), 205–237. https://doi.org/10.1080/10447310701702352

Maria, M., Shahbodin, F., & Pee, N. C. (2018). Malaysian higher education system towards industry 4.0 – Current trends overview. 020081. https://doi.org/10.1063/1.5055483

Mohd Satar, N. S., Dastane, O., & Morshidi, A. (2021). E-learning Satisfaction during COVID-19 Pandemic Lockdown: Analyzing Key Mediators. International Journal of Management, Accounting, and Economics, 8(8).

Nathan, L. (2019, July 2). Covid-19 — how one pandemic transforms the education system worldwide. The Malaysia Reserve. https://themalaysianreserve.com/2020/07/02/covid-19-how-one-pandemic-transforms-education-system-worldwide/

Rasiah, R., Yun Low, W., & Kamaruddin, N. (2023). Digitalization and Development; Ecosystem for Promoting Industrial Revolution 4.0 Technologies in Malaysia. www.routledge.com/

Reith-Hall, E., & Montgomery, P. (2023). Communication skills training for improving the communicative abilities of student social workers: A systematic review. Campbell Systematic Reviews, 19(1), 1–46. https://doi.org/10.1002/cl2.1309

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods For Business Students (8th ed.). Pearson Education Limited.

Schwab, K. (2016). The Fourth Industrial Revolution. www.weforum.org

Silalahi, D. E., Hotmadinar Sianipar, H., & Kurnia, I. (2020). Agility of Male and Female Students through Online Learning during Covid-19. www.globalscientificjournal.com

Silva, E. (2009). Measuring Skills for 21st-Century Learning. Phi Delta Kappan, 90(9), 630–634. https://doi.org/10.1177/003172170909000905

Singh, H. (2019, May 16). Delivering game-changing initiatives for national education. The Malaysian Reserve. https://themalaysianreserve.com/2019/05/16/delivering-game-changing-initiatives-for-national-education/

Slavin, R. E. (1978). Student teams and comparison among equals Effects on academic performance and student attitudes. Journal of Educational Psychology, 70(4), 532–538. https://doi.org/10.1037/0022-0663.70.4.532

Tan, J. P.-L., Choo, S. S., Kang, T., & Liem, G. A. D. (2017). Educating for twenty-first-century competencies and future-ready learners: research perspectives from Singapore. Asia Pacific Journal of Education, 37(4), 425–436. https://doi.org/10.1080/02188791.2017.1405475

Tang, G., Yu, B., Cooke, F. L., & Chen, Y. (2017). High-performance work system and employee creativity: The roles of perceived organizational support and devolved management. Personnel Review, 46(7), 1318–1334. https://doi.org/10.1108/PR-09-2016-0235

The Research Advisors. (2006). Sample Size Table. https://www.research-advisors.com/tools/SampleSize.htm

Vadakalu Elumalai, K., P Sankar, J., R, K., Ann John, J., Menon, N., Salem M Alqahtani, M., & Abdulaziz Abumelha, M. (2020). Factors Affecting the Quality of E-Learning During the COVID-19 Pandemic from the Perspective of Higher Education Students. Journal of Information Technology Education: Research, 19, 731–753. https://doi.org/10.28945/4628

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2015). Internet skill levels increase, but gaps widen a longitudinal cross-sectional analysis (2010–2013) among the Dutch population. Information, Communication & Society, 18(7), 782–797. https://doi.org/10.1080/1369118X.2014.994544

van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review. SAGE Open, 10(1), 215824401990017. https://doi.org/10.1177/2158244019900176