Predictors of academic achievement: The role of positive lecturer-student relationships in visible learning mind frames

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Abstract

This study examines the role of positive lecturer-student relationships in predicting students' academic achievement through Visible Learning Mindframes in higher education in Malaysia. The study explores the socio-emotional aspects of learning, which was focused on Mindframe 7 (developing positive relationships). A mixed-method approach was employed, incorporating quantitative data from 416 students at a private higher education institution, along with qualitative interviews to obtain insights into students' perspectives on Visible Learning Mindframes. Findings indicated that Mindframe 7 was a significant predictor of academic achievement, emphasizing the importance of positive relationships to promote a sense of belonging, inner confidence, and motivation in learning. Considering the emphasis on social-emotional learning (SEL) and the integration of artificial intelligence and Internet of Things technologies in contemporary education, findings suggest that positive relationships between lecturers and students can improve learning achievement. This study highlights the need for higher education institutions to prioritize SEL among lecturers and utilize technologies that support real-time learning feedback and performance monitoring. Overall, this study contributes to the dearth of knowledge on Visible Learning observed in Malaysia and sheds light on the important role of socio-emotional aspects in ensuring students' learning gains.

Keywords: Lecturer-student relationships, Socio-emotional learning, Visible learning mind frames.

1. Introduction

The information and digital technology era emerged at the beginning of the 21st century, which led to the dominance of contemporary teaching and learning methodologies. This educational shift drives a surge in knowledge sharing and learning acquisition among students. Thus, effective teaching and learning are crucial to creating a quality learning environment, especially in higher education. Lecturers need to focus on well-defined learning outcomes in learning and consider the perceptions of students in exploring their understanding of learning. Hence, seeing learning from the students' perspective. These are the fundamental principles in Visible Learning Mindframes, which closely align with Outcome-Based Education (OBE).

Visible Learning was founded by John Hattie, which emphasizes positive teaching strategies that have significant beneficial effects on student learning. Both students and lecturers must understand the learning outcomes clearly in the courses, in addition to lecturers cultivating a positive learning environment through various strategies. Visible Learning enriches OBE by valuing student learning experiences in the classrooms and furnishing them with the necessary learning skills and competencies to excel in their respective industries [1].

Visible Learning Mindframes are based on the four core constructs: engagement, learning environment, feedback and evaluation, and knowing thy impact. The mindframes value active student engagement and learning motivation, which contribute to positive student learning achievement. This is in line with the Malaysian Education Blueprint 2015-2025 in achieving sustainable excellence in the higher education field, with the aim of raising graduate employability rates from 75% to more than 80% by the year 2025 [2]. Within this framework, Visible Learning is crucial to ensure students meet the learning outcomes and become competent graduates.

The Ministry of Higher Education has implemented the University Transformation Programme (UniTP) to improve financial sustainability and academic productivity in higher educational institutions. By improving instructional strategies, the institutions can better meet the demands of contemporary education [3]. Thus, this study primarily aims to investigate students' perceptions of Visible Learning and explore the mind frames that are significant predictors of academic achievement.

2. Literature Review
2.1. Visible Learning

Promoting a high-quality learning environment requires a strong emphasis on addressing students' needs in the classroom, making teaching and learning a dominant element of Visible Learning. Visible Learning makes student learning observable and measurable in ensuring effective teaching and learning processes. Several studies have shown the positive impact of Visible Learning on student learning achievement [4].

The Visible Learning framework consists of Ten Mindframes as shown in Figure 1.
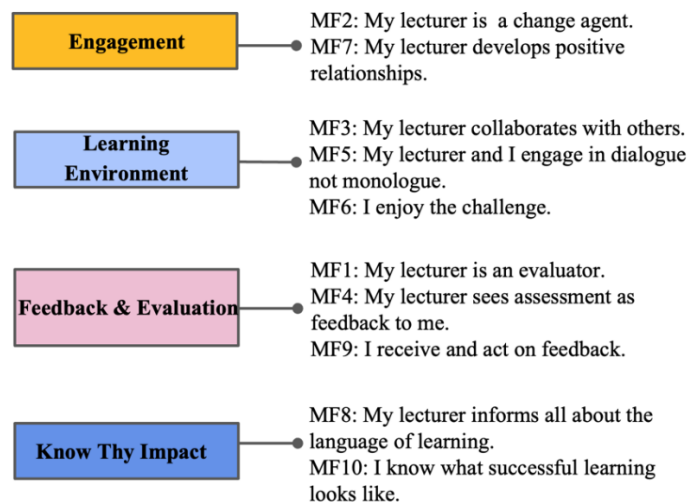
Figure 1.
The Visible Learning Mind Frames.

These mindframes are examined in four constructs: engagement, learning environment, feedback, and evaluation, and know thy impact. The four constructs are rooted in various learning theories, such as Piaget's cognitive constructivism, Vygotsky's sociocultural theory, and Dewey's experiential learning. Students develop cognition and positive learning behaviors needed for learning when they are actively constructing knowledge and participating in a well-structured learning environment. The following sections provide a more detailed discussion of the four Visible Learning constructs that underline the ten mindframes.

2.1.1. Engagement

Engagement involves the active and meaningful participation of students in the learning process. Students who are engaged in learning demonstrate motivation and develop a positive interest in learning activities through positive interactions. There are three components of student engagement: behavioral, emotional, and cognitive engagement, which are essential for improving student learning achievement [5]. Within Visible Learning, two mindframes are categorized under the engagement construct: Mindframe 2, where the lecturer acts as a change agent, focusing on behavioral engagement, and Mindframe 7, which emphasizes the development of positive relationships, contributing to emotional engagement.

For students and lecturers to acquire Mindframe 2, being the change agents, students need to develop positive attitudes toward learning and take ownership of their learning progress; lecturers, on the other hand, should consistently transform their teaching pedagogies to challenge students and meet their diverse learning needs. Mindframe 7 emphasizes establishing positive and supportive relationships between students and lecturers, creating an environment where students feel valued and motivated to learn.

2.1.2. Learning Environment

In a constructivist learning environment, students need to be active in their learning by constructing knowledge through interaction and participation. Research shows that integrating social learning tools into constructive learning enhances students' learning experiences [6]. Within the Visible Learning framework, there are three mindframes that are aligned with the constructivist approach: Mindframe 3 (collaborating with the lecturer), Mindframe 5 (engaging in dialogue rather than monologue), and Mindframe 6 (embracing challenges). Studies point out that lecturers often dominate the teaching and learning process, limiting student interaction and engagement [7].

Mindframe 3 emphasizes active collaboration between students and lecturers in learning activities. Mindframe 5 promotes interactive, two-way communication, enabling meaningful discussions. Mindframe 6 encourages students to see challenges as opportunities for learning. However, recent findings revealed that many students need help with learner autonomy and are unconfident when facing academic challenges [8].

2.1.3. Feedback and Evaluation

Feedback and evaluation are crucial for student learning improvement, which helps students evaluate and enhance their learning. Research showed the importance of providing various forms of feedback in higher education learning, with 85% of the lecturers reporting changes to their teaching pedagogies based on student feedback [9]. Three mindframes are under the feedback and evaluation construct: Mindframe 1 (the lecturer as an evaluator), Mindframe 4 (assessment as feedback), and Mindframe 9 (students receiving and acting on feedback).

Mindframe 1 highlights the lecturer's role in assessing and monitoring student progress. Mindframe 4 promotes the use of assessments as a means of providing constructive feedback to the students. Mindframe 9 emphasizes the importance of students reflecting on feedback to explore their strengths and areas for improvement, thereby enhancing their learning [10].

2.1.4. Know Thy Impact

The "Know thy impact" refers to the roles of the lecturers in evaluating the effects of their teaching on student learning [11]. Effective lecturers consistently reflect on their teaching practices and explore ways to improve the quality of teaching and learning environment. Two mindframes under this construct: Mindframe 8 (understanding the language of learning) and Mindframe 10 (recognising successful learning).

Mindframe 8 emphasizes the significance of lecturers explaining the process and language of learning to students in assisting their understanding of both the 'what' and 'how' of learning. Mindframe 10 refers to students reflecting constantly on their learning achievements and recognizing the characteristics of successful learning.

2.2. Aim of the Study

The importance of embracing Visible Learning Mindframes is to cultivate an effective teaching and learning environment that fosters student engagement, motivation, and academic achievement. Previous studies have shown that adopting Visible Learning Mindframes can significantly improve both student engagement and learning performance [12]. Visible Learning emphasizes constructive feedback, student-teacher collaboration, and reflective teaching practices, which are associated with improving student motivation, awareness, and self-regulation [11]. Research suggests that when lecturers actively incorporate these mindframes in teaching and learning, students are more likely to engage, internalize learning, and gain a deeper understanding of learning content. Additionally, research shows that the socio-emotional aspects of learning, such as establishing positive student-teacher relationships, create a supportive learning environment that ultimately promotes student academic success and resilience [13]. In order to create a high-quality learning environment that fosters continued learning, students and lecturers need to consistently adopt these mindframes.

Although studies have indicated that, mindframes on positive feedback and active learning affect students' learning performances, not many examined which specific mindframes significantly impact students' learning outcomes, from the eyes of the students. Therefore, this study aimed to explore Visible Learning Mindframes by exploring students' perceptions and identify which mindframes have the greatest impact on student learning. This study aims to answer the following research questions:

- What are students' perspectives on the Visible Learning Mindframes?
- Which mind frame, according to students' perspectives on Visible Learning, makes a statistically significant contribution to students' academic achievement?

3. Methodology

The following section provides a brief overview of the research methodology that was utilized by the study.

3.1. Research Setting

This study was conducted at a private institution of higher education located in the Klang Valley, Malaysia. The university referred to as University X in this study is a leading university offering a diverse range of programs and courses ranging from business, education, medicine, dentistry, and engineering to Information Technology. Today, it is a vibrant educational hub with branch campuses across Malaysia, attracting both local and international students alike.

3.2. Research Design

This study employed a mixed-methods approach with an explanatory sequential design. In this study, the quantitative data was first collected via a questionnaire to provide an initial understanding of the phenomenon being studied. These findings were then expanded with in-depth exploration utilizing qualitative data collected via focus groups and face-to-face interviews. Such a measure not only aids in data triangulation but more importantly enhances the validity and reliability of the findings obtained [14].

3.3. Population

This study involved a total of 416 undergraduate students from both science and social science faculties. In this study, the 416 students were all sophomores, as the researchers felt they were better acclimatized to tertiary education and would hence be able to provide a more balanced perspective on tertiary education compared to first-year students. On the other hand, final-year students were not chosen primarily because a majority of them were under pressure to complete their internship programs or final-year dissertations or projects.

The 416 respondents were selected based on the stratified random sampling method, as it helps to provide a better representation of the distinct subgroups within the population, i.e., pure sciences and non-science groups. It was felt that such a move would ensure the representativeness of the two distinct subgroups (strata) of discipline (Sciences and Non-Sciences), help to reduce sampling bias, and increase precision, leading to more generalizable results when compared to simple random sampling [15]. Hence, out of the 416 respondents, the final sample comprised 213 science students (51%) and 203 non-science students (49%). For the qualitative component, a total of 21 students participated in interviews, with 13 involved in focus group discussions and eight volunteering for individual interviews.

3.4. Instrumentation

The data for the study were collected via two main instruments, namely a questionnaire and semi-structured interviews. The questionnaire which aimed to investigate the respondents' perspectives of visible learning was adapted from the Mindframes Survey developed by Visible Learning Plus [16].

Two types of interviews were conducted: face-to-face interviews and focus groups, depending on the availability of the study. In total, 21 students were interviewed, comprising students from both the sciences (12) and the non-sciences (9).

3.5. Validity and Reliability

The quantitative data utilizing the questionnaire were collected via face-to-face interactions and online Google Forms. Data cleaning was performed to identify and address issues such as incomplete responses, missing values, input errors, and outliers. This process also included normality tests to ensure data integrity, subsequently improving the reliability and validity of the findings [14]. Under the data analysis aspect for research question one, descriptive statistics such as means and standard deviations were adopted to analyze the quantitative data, while thematic analysis was applied to the interview transcripts. Under the second research question, inferential statistics employing multiple regression analysis were conducted using SmartPLS software version 3.3.3 to explore which Visible Learning midframes served as significant predictors of academic achievement. Effect sizes were calculated to identify the most significant mind frame for students' academic achievement.

The adapted questionnaire was later validated by a panel of three experts. The reliability of the questionnaire was determined by a Cronbach's alpha score of .98, which falls within the high-reliability range [17]. Peer debriefing and intercoder reliability checks were employed to assess the consistency of interview coding. With a Cohen's kappa score of .77, the agreement level between the two peer debriefers was deemed moderate but acceptable.

Ethical standards were highly emphasized throughout the study by obtaining approvals from institutional authorities and ensuring the use of pseudonyms to protect participant anonymity.

4. Findings

The findings presented here are based on the two research questions that guided this study.

4.1. Research Question 1

4.1.1. What are students' perspectives on Visible Learning Mindframes?

The first research question examined students' perspectives on Visible Learning Mindframes. Table 1 shows the mean scores and standard deviations for each mind frame construct: engagement, learning environment, feedback, evaluation, and know thy impact.

The results revealed that the learning environment construct (M=3.10, SD=.38) and engagement construct (M=3.10, SD=.43) recorded the highest mean score, indicating a moderate level of agreement. In this study, a score above 3.50 was

considered strong agreement, 3.00-3.40 suggested moderate agreement, and a score less than 3.00 indicated disagreement. The learning environment and engagement showed a moderate score, in which students felt they were moderately engaged in learning and constructing their understanding through interaction in the learning environment.

Table 1.
Students' perspectives on Visible Learning Mindframe constructs (n=416).

Constructs	Mean	Standard Deviation
Engagement	3.10	0.43
Learning environment	3.10	0.38
Feedback and evaluation	3.04	0.39
Know thy impact	3.08	0.36

Note: Scale: 1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree

Subsequently, the specific Visible Learning Mindframes were analyzed, in which the results (Table 2) showed that the mindframe on lecturers developing positive relationships with students (M=3.14, SD=0.61) recorded the highest agreement. This suggested that students highly value a supportive relationship with the lecturers, reflecting that student-lecturer interactions play an important role in academic achievement. In contrast, the mindframe on lecturers seeing assessment as feedback to students (M=3.01, SD=0.61) recorded the lowest agreement, indicating a gap in how students perceive assessment in contributing to their learning development.

Table 2.
Students' perspectives on Visible Learning Mindframes (n=416).

Visible Learning Mindframes	Mean	Standard Deviation
Mindframe 1: My lecturer is an evaluator.	3.09	0.55
Mindframe 2: My lecturer is a change agent.	3.07	0.63
Mindframe 3: My lecturer collaborates with me.	3.12	0.58
Mindframe 4: My lecturer sees assessment as feedback to me.	3.01	0.61
Mindframe 5: My lecturer and I engage in dialogue, not monologue.	3.08	0.61
Mindframe 6: I enjoy the challenge.	3.09	0.58
Mindframe 7: My lecturer develops positive relationships.	3.14	0.61
Mindframe 8: My lecturer informs me all about the language of learning.	3.06	0.57
Mindframe 9: I receive and act on feedback.	3.05	0.64
Mindframe 10: I know what successful learning looks like.	3.11	0.57

Note: Scale: 1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree

Qualitative findings reflected the quantitative findings under Mindframe 7, which emphasized developing positive relationships. Students (FGI2_S2, FGI3_S3, INT5) commented that their lecturers created a sense of belonging and built good friendships that contributed to a supportive learning environment. The positive relationship with lecturers contributed to the positive well-being of the students. The supporting quotes from students are as follows:

"So we laugh about things, and when I am stressed, she also comforts me and gives me encouragement. Therefore, we are like friends." (FGI2_S2_241120).

"There is one lecturer who is very, very, very close to us. It is like a very good friendship going on between lecturers and students. That is how we learn." (FGI3_S3_201020).

"He (the lecturer) is not like a lecturer. He is like a friend also...He always talks to us and discusses the cooking style and also about his personal life." (INT5_221020).

The findings on Visible Learning Mindframes based on students' perspectives revealed the role of socio-emotional interactions in enhancing student academic achievement and their overall learning experiences. It was found that students often value constructive relationships, which are an essential key in promoting a conducive learning environment.

4.2. Research Question 2
4.2.1. Which Mindframe According to Students' Perspectives on Visible Learning Makes a Statistically Significant Contribution to Students' Academic Achievement?

A structural model was employed to explore which Visible Learning Mindframes significantly predict students' academic achievement. The R^2 value of 0.047 was obtained using a 5,000-sample bootstrapping procedure, indicating that the Ten Mindframes collectively explain 4.7% of the variance in students' academic performance (see Figure 2).
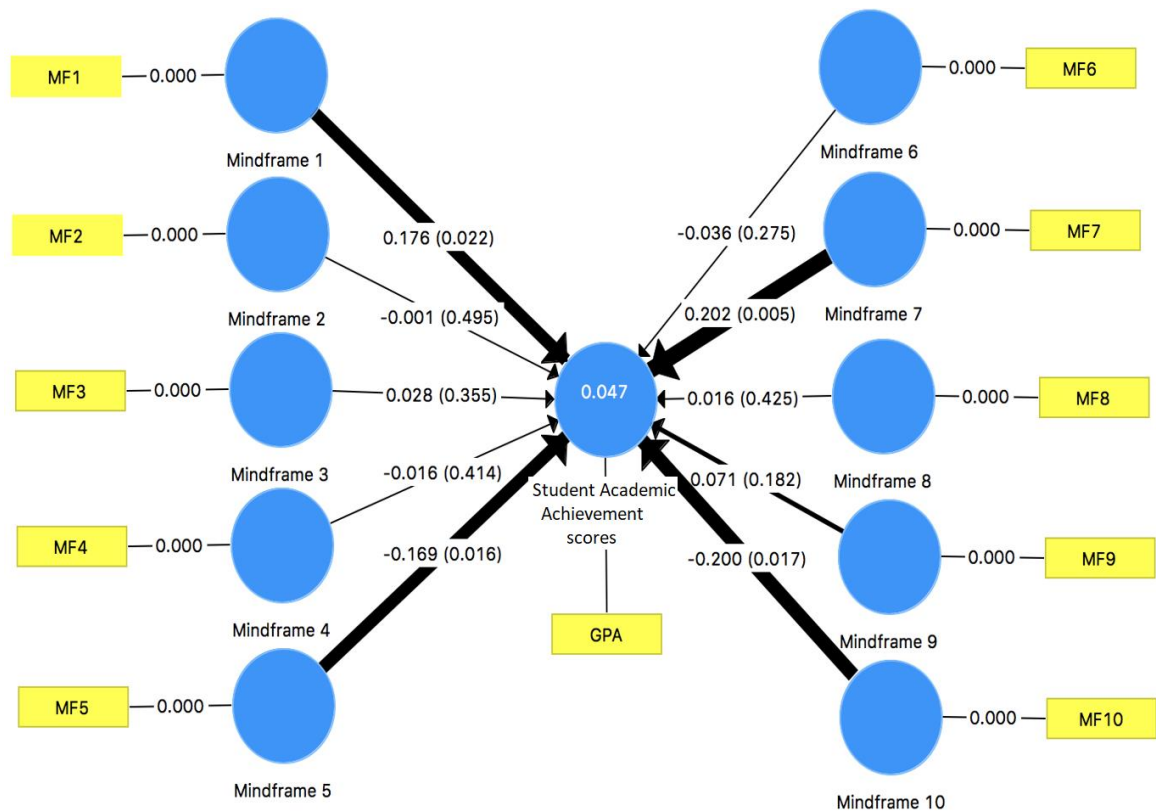
Figure 2.
Path coefficient of the structural model for the Visible Learning Mindframes.

The effect size for each Visible Learning Mindframe was determined through a detailed regression analysis, as shown in Table 3.

Table 3.
The summary of regression analysis on the Visible Learning Mindframes.

Relationship	f2	Effect size	Predictor mind frame
Mindframe 1: My lecturer is an evaluator. → Student Academic Achievement	0.01	No effect	No
Mindframe 2: My lecturer is a change agent. → Student Academic Achievement	0.00	No effect	No
Mindframe 3: My lecturer collaborates with me. → Student Academic Achievement	0.00	No effect	No
Mindframe 4: My lecturer sees assessment as feedback to me. → Student Academic Achievement	0.00	No effect	No
Mindframe 5: My lecturer and I engage in dialogue not monologue.→ Student Academic Achievement	0.01	No effect	No
Mindframe 6: I enjoy the challenge. → Student Academic Achievement	0.00	No effect	No
Mindframe 7: My lecturer develops positive relationships. → Student Academic Achievement	0.02	Small effect	Yes
Mindframe 8: My lecturer informs me all about the language of learning. → Student Academic Achievement	0.00	No effect	No
Mindframe 9: I receive and act on feedback. → Student Academic Achievement	0.00	No effect	No
Mindframe 10: I know what successful learning looks like. → Student Academic Achievement	0.01	No effect	No

The findings indicated that Mindframe 7: My lecturer develops positive relationships was the mindframe with a statistically significant impact on students' academic achievement, with a small effect size ($f^2=0.20$). Based on Cohen's (1988) guidelines, effect sizes between 0.10 and 0.30 represent small effect sizes. Hence, these findings showed that developing positive relationships has a meaningful but modest contribution to students' academic achievement.

5. Discussion

5.1. The Learning Environment Construct

Findings from the data analysis demonstrate that the learning environment construct of Visible Learning Mindframes achieved the highest level of agreement, highlighting its importance in promoting effective learning. This finding is consistent with Piaget's theory that students actively construct knowledge through interactions with teachers, peers, and their learning environment [18].

As shown, interactions fostered meaningful learning engagement, allowing participants to see learning from various perspectives and integrate knowledge into their existing concepts. Advanced educational technologies, such as Artificial Intelligence (AI) and the Internet of Things (IoT), further enhanced the constructivist learning process. Participants felt more empowered and excited in learning when lecturers incorporated advanced technologies to improve engagement in constructing their knowledge. AI-powered adaptive learning systems, such as personalizing learning paces and providing real-time feedback, also help students take ownership of their learning [19]. Their learning became more meaningful and interesting through an active process of constructing understanding [20]. Learning is more meaningful and engaging when students are engaged in constructing their understanding, allowing them to relate new information to prior knowledge. This hands-on approach not only increases understanding but also motivation, as students take ownership of their learning and see the relevance of the learning content to their experiences.

Moreover, learning analytics allows lecturers to better track student progress [21]. In a constructivist learning environment, the personalized approach to analyzing students' learning promotes deep student engagement by allowing students to participate actively in their knowledge construction. Technology-based learning environments provide students with ample opportunities to connect their existing cognitive frameworks with new information, which is a central tenet of constructivist theory. Hence, allowing more personalized learning support and fostering closer lecturer-student relationships is a crucial aspect of Visible Learning, as lecturers can tailor their teaching and interactions to better support the students based on the data obtained from AI-powered analytics on student learning. Students' perspectives suggest that the technology-enhanced learning environment enables them to be more active in creating their knowledge, therefore reinforcing the importance of constructivism in enhancing their academic achievement.

5.2. Predictor of Academic Achievement: Positive Lecturer-Student Relationships

The socio-emotional aspect of education, specifically the role of Mindframe 7: My lecturer develops positive relationships, emerged as the most significant contributor to students' academic achievement. Positive lecturer-student relationships promote a sense of belonging, emotional attachment, and well-being, which are critical for academic success [13]. This finding is in line with the focus on social-emotional learning in Filgona, et al. [13] where developing social-emotional competence and positive relationships in the learning environment are crucial to student learning success.

In today's contemporary educational landscape, compassion, emotional resilience, and well-being are increasingly important in socio-emotional development. It is crucial to foster learning environments where students feel more motivated and comfortable in developing initiative in learning and interacting with their peers and lecturers [22]. The findings of this study reveal that students feel much more motivated to learn when their lecturers are approachable and friendly. Research also showed that strong learning motivation in students leads to better academic performance [23]. Therefore, the emotional support from lecturers has a mediating effect in improving students' academic engagement and competence. Positive lecturer-student relationships empower students to build emotional resilience, as students are more able to manage their stress if lecturers are there to encourage and support them. This helps student develop positive coping mechanisms, which improves their resilience in facing academic challenges.

In addition, incorporating AI and IoT in education can enhance the socio-emotional aspects of learning. Artificial intelligence-based emotion analysis tools are able to assess the emotional states of the students through facial recognition and emotion analysis. This provides real-time information about the emotional state of the students, which enables the lecturers to respond appropriately [24]. Hence, the lecturers can act promptly in creating a supportive and flexible learning environment by emphasizing emotional regulation and social interaction. With more prompt support from lecturers, students feel understood and valued. Ultimately, they develop better trust and confidence, which leads to improved academic achievement.

The qualitative and quantitative findings indicated that students highly valued these social-emotional factors in learning. They believe that positive relationships with lecturers lead to a more collaborative and supportive learning environment that transforms their educational experiences. Therefore, using technology to increase learning engagement and emotional competence in education will be critical to further strengthening these relationships and improving students' academic achievement.

6. Conclusion and Recommendations

This study makes a significant contribution to the notion of Visible Learning and its impact on student's academic achievement in the context of higher education in Malaysia. This study is one of the few studies on Visible Learning in Malaysia, hence filling the gap by examining the Visible Learning Mindframes, in which Mindframe 7 of developing positive relationships with students appeared to be the most significant predictor of students' academic achievement. This study highlights the importance of socio-emotional aspects in learning, which contributes to the theoretical and practical contributions to the field.

This study provides valuable insights into how positive lecturer-student relationships enhance students' academic success in higher education contexts. As Visible Learning is increasingly valued in education, this study has expanded its application in Malaysia, offering localized findings on its implications. The emphasis of Mindframe 7 highlights the

importance of socio-emotional well-being as a key to improving students' learning gains. These findings contribute to a more contextualized understanding of the role of social-emotional aspects in learning, aligning with the contemporary educational shift to emphasize learning engagement, motivation, and well-being as central to academic competence.

A limitation of this study is the focus on a private higher education institution in Malaysia, which limits the generalizability of the findings. A larger and more diverse sample of public and private institutions in Malaysia would provide deeper insight into Visible Learning.

Theoretically, this study contributes to the understanding of Visible Learning by highlighting the role of socio-emotional paradigms in Mindframe 7. The findings are consistent with Hattie [11] theory that positive relationships between educators and students improve learning effectiveness. This study reinforces the importance of seeing learning from students' eyes, which is crucial in Visible Learning. It also suggests that the emotional and interaction aspects are essential in ensuring academic success, particularly in higher education contexts.

Practically, the study suggests contemporary teaching and learning strategies for lecturers and management teams in higher education. The institutions can incorporate the emphasis on developing positive relationships into their policies and curricula, ensuring lecturers promote social-emotional learning in their practices. The institutions can also adopt AI-powered tools and IoT-enabled technologies to monitor student engagement and provide real-time feedback, which facilitates teaching and learning interactions.

In conclusion, this study contributes to the Visible Learning concept and reveals the importance of Mindframe 7 in developing positive relationships with students to improve their learning. Although this study was limited to a private higher education institution, its findings underscore the crucial role of socio-emotional aspects in enhancing students' academic performance. Hence, higher education institutions should focus on fostering positive relationships between lecturers and students by incorporating socio-emotional learning and advanced technologies to create a more supportive learning environment.

6.1. Suggestion for Future Research

The findings of this study have important implications for lecturers and management leaders in Malaysian higher education institutions. The prominence of Mindframe 7 recommends that institutions should focus on promoting positive relationships between lecturers and students as a means of improving students' academic learning. Higher education institutions can empower lecturers with emotional intelligence and relationship-building techniques through professional development programs. The institutions should also create more interactive activities, such as mentorship programs, gatherings, or events to encourage interaction between students and lecturers. Future studies should extend the scope of study to different levels of education, for example, primary, secondary, and other higher education institutions, and to include various research methodologies, such as classroom observations and longitudinal studies, to obtain a more holistic perspective of Visible Learning.

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