

The Level of Artificial Intelligence and Instructional Leadership of Secondary School Teachers in Sabah: A Pilot Study

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DOI: <https://dx.doi.org/10.47772/IJRISS.2026.1026EDU0531>

Received: 12 August 2026; Accepted: 17 August 2026; Published: 26 August 2026

ABSTRACT

The purpose of this study is to gain an initial understanding of the level of Artificial Intelligence (AI) and instructional leadership among secondary school teachers in Sabah. This study uses a quantitative approach with a survey research design. The AI variable is measured using the instrument developed by Fred D. Davis (1989). Meanwhile, the variable of teachers' instructional leadership was measured and adapted from the instructional leadership instrument developed by Philip and Hallinger (1985). The implementation of this study only focused on teachers from secondary schools located in Sabah with the involvement of 100 respondents selected using a simple random sampling technique. Data analysis reported that AI is at a high level ($M=3.88$, $SD=0.43$). Meanwhile, the dimension of teachers' instructional leadership is at a moderate level ($M=3.02$, $SD=0.59$). The implementation of this study is expected to provide an initial insight into the importance of AI in teacher instructional leadership to the responsible parties, who can then take drastic steps to enhance the efficiency of teacher instructional leadership in using AI to perform tasks, especially those involving teaching activities.

Keywords: Artificial Intelligence, instructional leadership, teachers, secondary schools, and Sabah

INTRODUCTION

Malaysia is among the countries that are not lagging behind in the development of digital transformation, where Artificial Intelligence (AI) has been implemented in education. The integration of AI in the education system is now receiving attention from instructional leadership among teachers in Malaysia, particularly in Sabah, to be utilized as a medium to enhance the effectiveness of the teaching and learning process. According to Lee Bih Ni (2025), the presence of AI integrated into the education system has brought significant changes to students today in terms of how they learn, think, and envision their roles in society. Therefore, the Ministry of Education Malaysia introduced the Digital Education Policy in 2023, which includes one of its key pillars, namely Pillar 2: Digital Competent Educators (MOE, 2023). The action taken by the Ministry of Education (MOE) is to ensure that teachers possess high competence in integrating AI into teaching and learning activities. Therefore, a study on the use of AI and instructional leadership of teachers in secondary schools was conducted so that this study can serve as a reference for stakeholders, particularly among teachers instructional leadership, on the importance of AI in the teaching and learning process.

BACKGROUND OF THE STUDY

Recently, AI has experienced a significant leap, especially in the field of education in Malaysia. This has indirectly transformed teachers' teaching style from traditional methods to AI-based teaching methods. However, the reality faced by teachers today is the lack of skills in using AI (Geoffrey et al., 2024). Teachers who lack skills in using AI will find it difficult to provide effective teaching aids, and this indirectly leads to a lesser practice of creative elements in teaching and learning. Such issues will impact the aspect of teachers instructional leadership in developing a conducive classroom environment (Apidah Amin, 2023). This is because teachers instructional leadership is responsible for controlling the use of AI in teaching and learning to align with learning objectives. However, the absence of clear guidelines can lead to an uncomfortable classroom atmosphere.

Moreover, Diah Octovia Kusuma Wardani and Gani Patindra (2025) in their study highlighted the existence of a gap between the use of AI and teachers instructional leadership in the implementation of teaching and learning. Although AI has the potential to assist teachers' instructional leadership in creating effective and efficient teaching plans, there are still teachers who lack the competence to use AI optimally in their teaching. The lack of competence has indirectly created a difference between teachers' instructional leadership who are skilled and those who are not in using AI in teaching and learning. Considering the various issues faced by teachers' instructional leadership in integrating AI, it has become a necessity for researchers to conduct a study on the relationship between AI levels and the instructional leadership of secondary school teachers in Sabah: a pilot study.

PROBLEM STATEMENT

Teacher instructional leadership plays a crucial role in the teaching and learning process to ensure that its implementation generates a significant impact. This is because teacher instructional leadership is not merely concerned with the transmission of knowledge but also involves the responsibility of guiding students towards achieving academic excellence. However, fostering academic excellence among students is not an easy task, as teachers exercising instructional leadership are required to address various challenges, including issues related to student diversity (Zurina Mustafa et al., 2021). Teachers who encounter such challenges may experience difficulties in establishing appropriate instructional goals.

In this regard, the MOE has encouraged teachers to integrate Artificial Intelligence (AI) into teaching and learning through the Digital Education Policy, particularly under the second pillar, which emphasises digitally competent educators (MOE, 2023). This initiative was introduced because the integration of AI has the potential to further enrich the teaching and learning process (Dahliyah Abdul Jalil, 2024). However, the situation in Sabah presents a different context. Although teachers demonstrate a relatively favourable level of AI usage, they continue to encounter various barriers, particularly inadequate digital infrastructure in schools, as reported by Lee Bih Ni et al. (2025) in their study involving schools in Kota Belud, Kota Marudu, and Kota Kinabalu. In addition to inadequate school infrastructure, Aminah Jekri and Crispina Gregory K. Han (2024) reported that some teachers in Penampang lacked the knowledge and skills required to integrate AI into their teaching practices. This situation may consequently reduce teachers' interest in learning and adopting AI.

Nevertheless, the existing studies remain limited in scope, as they have only been conducted in selected districts of Sabah, including Kota Belud, Kota Marudu, Kota Kinabalu, and Penampang. A comprehensive study encompassing all districts in Sabah has yet to be undertaken. Therefore, the present study is conducted across Sabah to identify the level of AI usage and instructional leadership among teachers in the state.

STUDY OBJECTIVES

The study conducted is based on two research objectives, namely;

- 1) To identify the level of Artificial Intelligence usage among secondary school teachers in Sabah.
- 2) To identify the level of instructional leadership among secondary school teachers in Sabah.

STUDY HIGHLIGHTS

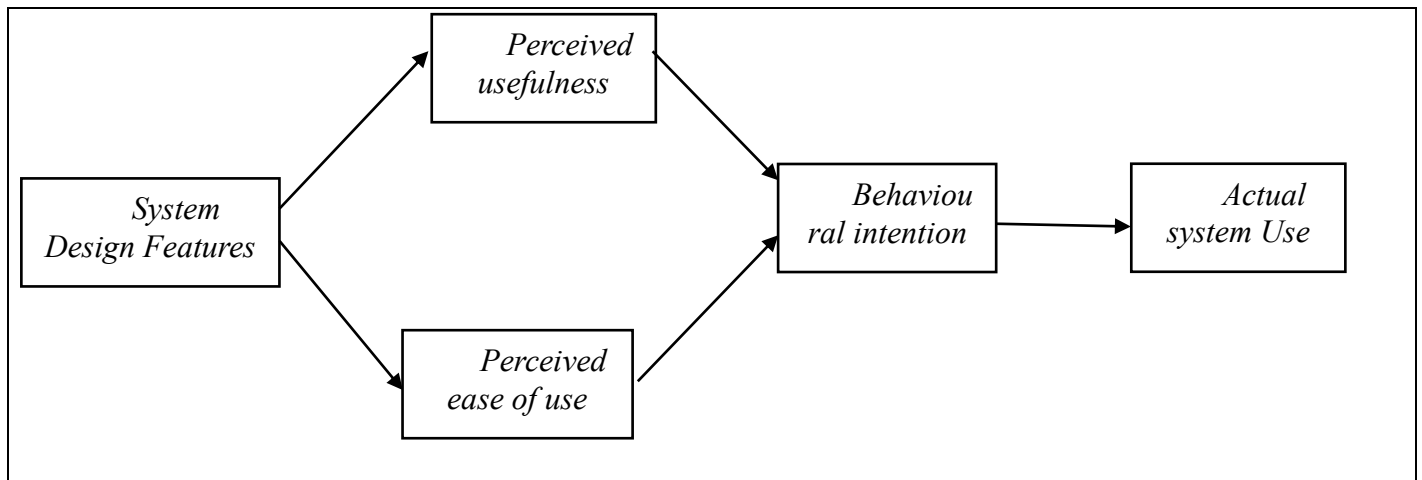
The present study comprises two variables, namely AI and teachers' instructional leadership, with each variable being underpinned by a specific theoretical model that will be discussed in this study. For the AI variable, the researcher adopts the Technology Acceptance Model (TAM), developed by Fred D. Davis in 1989. Meanwhile, the teachers' instructional leadership variable is examined based on the instructional leadership model developed by Hallinger and Murphy in 1985. Both models have been extensively adopted by researchers in both national and international contexts.

Artificial Intelligence

The TAM model is a model frequently used by many researchers studying technology, such as this study which examines AI. The TAM model was developed based on the Theory of Reasoned Action (TRA) (Ajzen

& Fisbein, 1980; Mohd Sobhi Ishak, 2014). The purpose of the TAMS model is to provide a foundation that can influence external variables on internal beliefs, behavioral intentions, and attitudes (Lu et al., 2003). There are two dimensions contained in the model, namely perceived usefulness and perceived ease of use.

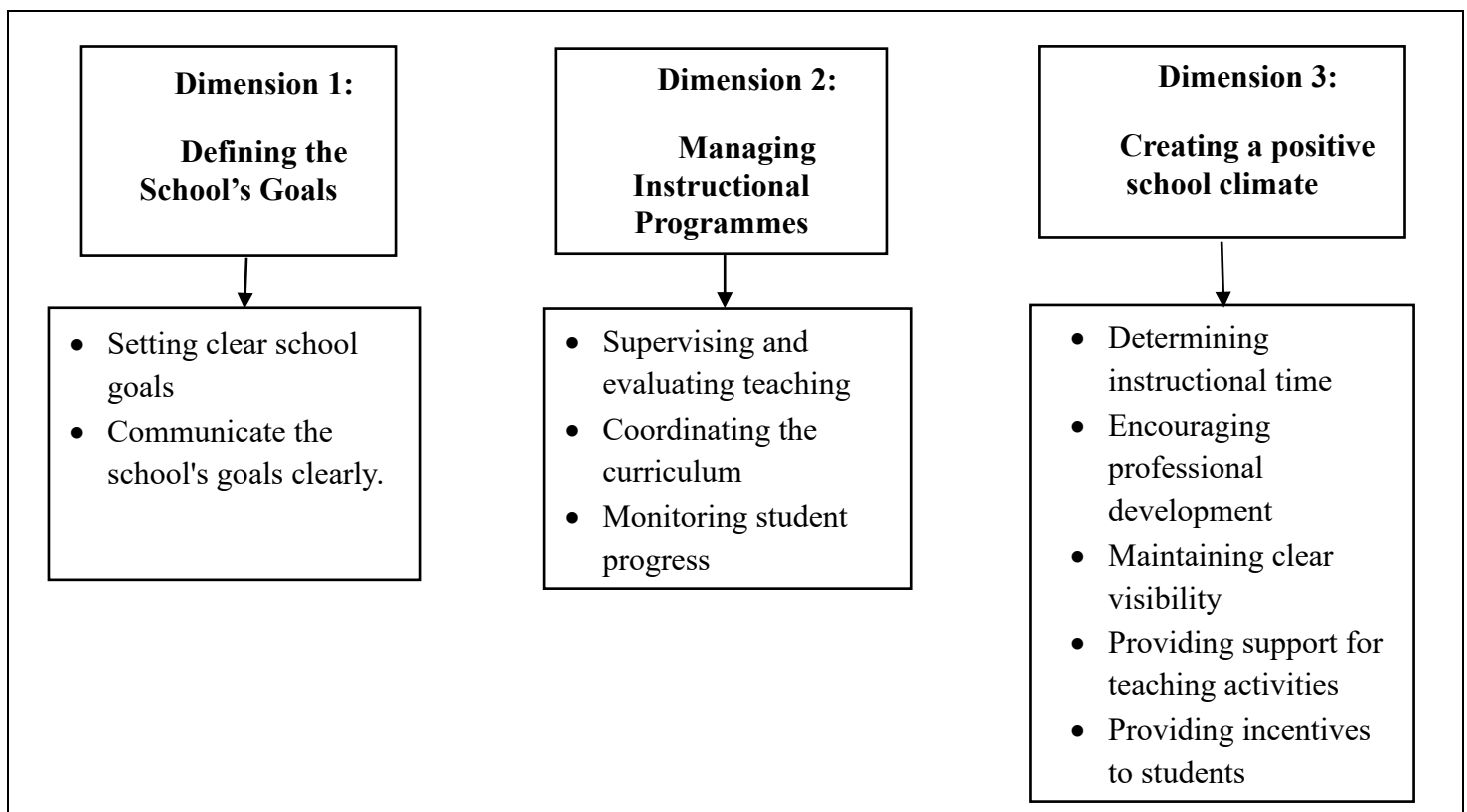
Figure 1: Technology Acceptance Model (TAM)



Source: Fred D Davis (1993)

Teacher Instructional Leadership

The instructional leadership model by Philip and Hallinger (1985) is used to represent the variable of this study, which is teacher instructional leadership. Although the model was developed in 1985, it is still relevant for researchers today who study instructional leadership among educators. The instructional leadership model is adapted from the Principal Instructional Management Rating Scale (PIMRS) (Hallinger & Wang, 2015). The model consists of three dimensions, namely i) defining the school's goals, ii) managing instructional programmes, and iii) developing a positive school climate. The three dimensions in the model are further divided into ten sub-dimensions, which can be seen in Figure 2 below.



Source: Hallinger dan Murphy (1985)

METHODOLOGY

Study Design

A survey-based quantitative approach was chosen to conduct this study. To obtain the data for this study, a questionnaire was used as the sole instrument. The implementation of this study is a preliminary survey before the actual research is conducted.

Population and Sample of the Study

This pilot study involved a small-scale sample of 100 respondents. The respondents were selected using a random sampling method among secondary schools teachers in Sabah, to satisfy the requirements for conducting a pilot study.

Questionnaire Instrument

The questionnaire instrument is used to test two research variables, namely AI and teacher instructional leadership. The instrument has been structured according to the appropriateness and capability to evaluate the variables more accurately through the use of a 5-point Likert scale, namely Likert scale 1 (Strongly Disagree), Likert scale 2 (Disagree), Likert scale 3 (Unsure), Likert scale 4 (Agree), and Likert scale 5 (Strongly Agree). The research instrument has been divided into three sections. Section A is related to demographics such as length of service, while Section B consists of AI items divided into two dimensions. Section C consists of teacher instructional leadership items divided into ten sub-dimensions. The AI instrument, consisting of 28 items was taken and adapted from the Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology questionnaire developed by Fred D. Davis in 2010. For the instructional leadership instrument, 50 items were taken and adapted from the Principal Instructional Management Rating Scale developed by Philip Hallinger and Murphy (1985).

INSTRUMENT RELIABILITY

The assessment of instrument reliability is essential to ensure the validity and stability of the research instrument. According to Kerlinger and Lee (2001), the implementation of a pilot study is intended to ensure that the questionnaire instrument employed meets five essential criteria, namely accuracy, usefulness, meaningfulness, defensibility, and appropriateness. Based on the reliability analysis conducted for the AI and teachers' instructional leadership variables, the AI variable demonstrated a high and satisfactory level of reliability, with a Cronbach's alpha value of .94. Meanwhile, the teachers' instructional leadership variable recorded a Cronbach's alpha value of .98. The overall Cronbach's alpha value for both variables was .96, indicating a high level of internal consistency and reliability. The results of the instrument reliability analysis for the AI and teachers' instructional leadership variables are presented in Table 1 below.

Table 1:Instrument Reliability Analysis

Variable	Number of Item	Alpha Value
Artificial Intelligence	28	0.94
Teacher Instructional Leadership	50	0.98
Total	78	0.96

Data Analysis Process

Statistical Package for the Social Sciences (SPSS) is the software employed to analyse the levels of AI usage and teachers' instructional leadership among secondary school teachers in Sabah. The data obtained from the study will be analysed using descriptive statistical analysis to determine the levels of AI usage and teachers' instructional leadership.

RESEARCH FINDINGS

Level of AI

Table 2 below shows the findings of the analysis on the level of AI among secondary school teachers in Sabah. Based on the findings, the highest mean value is in the first dimension, which is the perceived usefulness dimension with a mean value (mean=4.07, SP=0.52). Whereas the dimension of perceived ease of use has a mean value (mean=3.68, SP=0.45). The overall mean value of the AI dimension is at a high level with a value of (mean=3.88, SP=0.43). From the findings, it shows that the level of teacher integration in the use of AI is high.

Table 2: Analysis of AI Proficiency Levels of Secondary School Teachers in Sabah

Dimension	Mean	Standard Deviation	Level
Perceived Usefulness	4.07	0.52	High
Perceived Ease of Use	3.68	0.45	High
Total	3.88	0.43	High

Level of Teacher Instructional Leadership

Table 3 presents the analysis of the level of teachers' instructional leadership. Based on the analysis, the dimension of providing incentives to students recorded the highest mean score (M = 3.12, SD = 0.55), followed by communicate the school's goals clearly (M = 3.06, SD = 0.82), encouraging professional development (M = 3.06, SD = 0.81), setting clear school goals (M = 3.04, SD = 0.81), supervising and evaluating teaching (M = 3.02, SD = 0.83), monitoring student progress (M = 3.01, SD = 0.82), coordinating the curriculum (M = 3.00, SD = 0.86), determining instructional time (M = 3.00, SD = 0.78), and maintaining clear visibility (M = 3.00, SD = 0.74). Meanwhile, the dimension with the lowest mean score was providing support for teaching activities (M = 2.97, SD = 0.59). Overall, the analysis of the dimensions of teachers' instructional leadership indicated a moderate level (M = 3.02, SD = 0.59). This finding indicates that the implementation of teachers' instructional leadership roles was at a moderate level.

Table 3: Analysis of the Instructional Leadership Level of Secondary School Teachers in Sabah

Dimension	Mean	Standard Deviation	Level
Setting clear school goals	3.04	0.81	Moderate
Communicate the school's goals clearly.	3.06	0.82	Moderate
Supervising and evaluating teaching	3.02	0.83	Moderate
Coordinating the curriculum	3	0.86	Moderate
Monitoring student progress	3.01	0.82	Moderate
Determining instructional time	3	0.78	Moderate
Encouraging professional development	3.06	0.81	Moderate
Maintaining clear Visibility	3	0.74	Moderate
Providing support for teaching activities	2.97	0.59	Moderate
Providing incentives to students	3.12	0.55	Moderate
Total	3.02	0.59	Moderate

DISCUSSION

Based on the findings of this study, the AI dimensions will be arranged according to the dimensions that received the highest mean values. According to the results of the study on AI, the dimension of perceived usefulness is the highest-ranked dimension, followed by the second dimension, which is the dimension of perceived ease of use. From the study findings, it shows that teachers have acquired high levels of knowledge and skills in integrating AI. The findings of this study are in line with the findings of both domestic and international studies that have also implemented the same. For example, the findings of the study by Ting Siew Chear and Helmi Norman (2024) support this study's findings, where to enable teachers to apply AI in teaching and learning, strong support from higher authorities and social influence is needed. Moreover, foreign studies such as the one by Murniyetti et al. (2023) show that teachers extensively utilize AI in their teaching.

In addition, the stage of instructional leadership of teachers is also evaluated in this study. The assessment of teachers' instructional leadership was conducted through 10 sub-dimensions outlined in the Hallinger and Murphy 1985 instructional leadership model. The results of this study indicate that teachers instructional leadership is only at a moderate level. However, this finding differs from the findings reported by Nur Shahirah Mat Isa and Zamri Mahamod (2021), who found that teachers' ability to fulfil their responsibilities as instructional leaders was at a high level. This may be attributed to the effectiveness of the strategies employed by teachers in carrying out their instructional leadership responsibilities, particularly in the context of teaching and learning. Similarly, Khalip Musa and Rofidah Mohd Nasir (2018) found that teachers' instructional leadership was at a high level. Collectively, these findings provide an indication that the role of teachers as instructional leaders is important in fostering school excellence, particularly through the effective implementation of instructional practices and the continuous improvement of teaching and learning processes.

CONCLUSION

Generally, this pilot study is an initial step taken by the researcher to identify the validity and reliability of the instruments as well as the level of AI usage and instructional leadership among secondary school teachers in Sabah. Although the pilot study conducted has shown a high level of AI usage among teachers, the instructional leadership of the teachers is at a moderate level. The implementation of the pilot study has provided an initial picture that secondary school teachers in Sabah have a better grasp of AI usage. However, the results obtained from this study are preliminary. Therefore, a real study needs to be conducted in secondary schools in Sabah to see the extent of AI usage among the instructional leadership of secondary school teachers in Sabah.

APPRECIATION

Words of appreciation are directed to the lecturer who has helped in the successful writing of this article.

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