

The Relationship between Artificial Intelligence and the Instructional Leadership of Secondary School Teachers in Sabah

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ABSTRACT

The study conducted is to identify whether there is a relationship between Artificial Intelligence (AI) and the instructional leadership of secondary school teachers in Sabah. The presence of AI in the education system in Malaysia has brought about a significant change, especially in the practice of instructional leadership among teachers. The study conducted uses a quantitative approach with a non-experimental design. A total of 375 respondents were randomly selected to serve as the study sample. The implementation of this study used a questionnaire instrument. The Pearson Correlation Test was used to analyze the relationship between AI and the instructional leadership of secondary school teachers in Sabah. The Statistical Package for Social Sciences (SPSS) software was used to analyze the raw data from the respondents. The results of this study indicate a significant relationship between AI and the instructional leadership of secondary school teachers in Sabah ($r=0.421$, $p<0.05$). The study conducted is expected to add value to the instructional leadership of teachers to enhance the use of AI so that the aspirations of the Ministry of Education Malaysia (MOE) are achieved.

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

INTRODUCTION

Instructional leadership is a role that remains relevant in school institutions to enhance the quality of teaching and learning in schools. The concept of instructional leadership is often associated with the roles of headmasters and principals in schools, as seen in the studies by Yong King King et al. (2023), Siti Nuramal Jariah Kameri and Jamalul Lail Abdul Wahab (2022), and Jefri Mat Yasim et al. (2019), which examine the role of principals in instructional leadership. However, the concept of instructional leadership in schools today is not limited to principals or headmasters, but this role can also be played by teachers. This is because teachers today often take on the roles of principals and headmasters, such as systematically planning lessons, monitoring student progress, enhancing professional development for teaching and learning purposes, supporting teaching activities, and providing incentives to students. The role played by teachers is that they are individuals who interact directly with students and they strive to ensure that the teaching goals set are achieved.

The development of digital technology today has brought about a significant change to the role of instructional leadership of teachers. The industrial revolution that has occurred has introduced various innovations and the widespread use of Artificial Intelligence (AI), especially in the teaching and learning process. The presence of AI in the world of education enables teachers to plan lessons more effectively, produce more innovative teaching aids, and conduct analyzes of students' performance based on data obtained through instructional leadership. It aligns with the views expressed by Shaharudin Ismail et al., (2025) that AI is not just an additional technology but also has the potential to be a paradigm shift in the teaching and learning conducted by instructional leadership of teachers. Therefore, the mastery of AI by instructional leadership of teachers will be able to enhance the implementation of teaching and learning in the classroom.

To empower the use of AI in education in Malaysia, the Ministry of Education (MOE) Malaysia has outlined a digital transformation in education through the Malaysian Education Plan (RPM) 2026-2035 in its fourth core

area, which is to enhance the physical and digital infrastructure for all schools under MOE supervision (MOE, 2026). Therefore, to achieve the aspirations of the MOE in the Malaysian Education Plan (RPM), it is important for teacher instructional leadership to enhance the use of AI, particularly in teaching and learning. Teacher instructional leadership that can integrate AI into teaching and learning will be able to produce students who are scientifically minded, proficient in using technology, and capable of solving complex problems in the 21st century (Nurul Ezzati Abu Hasan, 2026). Therefore, to ensure that the instructional leadership of teachers can produce students proficient in the use of AI, the use of AI must be emphasized within the instructional leadership of teachers so that AI can be integrated into teaching and learning in the classroom by tailoring the learning content to the personal needs of the students (Nur Udhwa Ashikin Mohd Rani, 2025).

Problem Statement

The role of instructional leadership by teachers today is very important in ensuring the effectiveness of teaching and learning in schools. The instructional leadership of teachers not only plays a role in delivering the content of learning but also in planning lessons, determining effective teaching strategies, improving student achievement, and using student performance data to further enhance classroom teaching. According to Zuana Sulaiman et al., (2024), good instructional leadership by teachers will strive to contribute and add value to the excellence of the national education system by improving the quality of teaching and enhancing students' academic achievements more effectively. To achieve this aspiration, it is indeed necessary for instructional leadership by teachers to make greater efforts in enhancing professionalism, especially in the use of AI. The development of AI today is increasingly gaining attention in various sectors, particularly in the education sector. In line with this development, the MOE has taken very drastic steps to integrate AI into the national education system to keep up. This can be seen in the digital education policy introduced by MOE in 2023, which emphasizes the role of instructional leadership by teachers who need to be proficient in using digital tools (MOE, 2023). The government's action in formulating this policy is one of its efforts to produce students and instructional leadership by teachers who are proficient in digital usage (Fahmy A Rosli, 2023). Furthermore, in the direction of the education system for the next ten years, MOE also emphasizes the importance of AI in the Malaysian Education Plan (2026-2035). Therefore, the instructional leadership of teachers needs to take this matter seriously by integrating AI into classroom teaching so that the MOE aspiration to produce digitally literate students is achieved.

However, there are issues faced by instructional leadership in integrating AI into teaching and learning in the classroom. According to Ahmad Rifian Maula Zaki and Indana Ainiya Ulya (2025), teacher instructional leadership faces difficulties in adapting AI into teaching. The difficulties faced by teacher instructional leadership, which AI should ideally assist in enhancing their professionalism, are not being fully utilized by the teacher instructional leadership. This indirectly prevents teacher instructional leadership from achieving the MOE aspiration for them to be proficient in using digital technology like AI in classroom teaching and learning.

In addition, digital infrastructure constraints also pose a problem that hinders teachers' instructional leadership in integrating AI into classroom teaching (Nurul Ezzati Abu Hasan, 2026). Usually, digital infrastructure issues often occur in rural schools, as demonstrated by the study conducted by Lee Bih Ni et al., (2025) in three districts in Sabah, namely Kota Kinabalu, Kota Marudu, and Kota Belud. However, a study examining the relationship between AI and teachers' instructional leadership across the entire district has not yet been conducted in Sabah. Since the study has not yet been carried out in Sabah, this research will be conducted on secondary school teachers in Sabah to see whether there is a relationship between AI and teachers' instructional leadership or not.

Study Objectives

The implementation of this study is to identify the relationship between AI and the instructional leadership of secondary school teachers in Sabah. The following are the research objectives that will be examined;

- i. To examine the relationship between AI and instructional leadership of Secondary School Teachers in Sabah.

Research Hypothesis

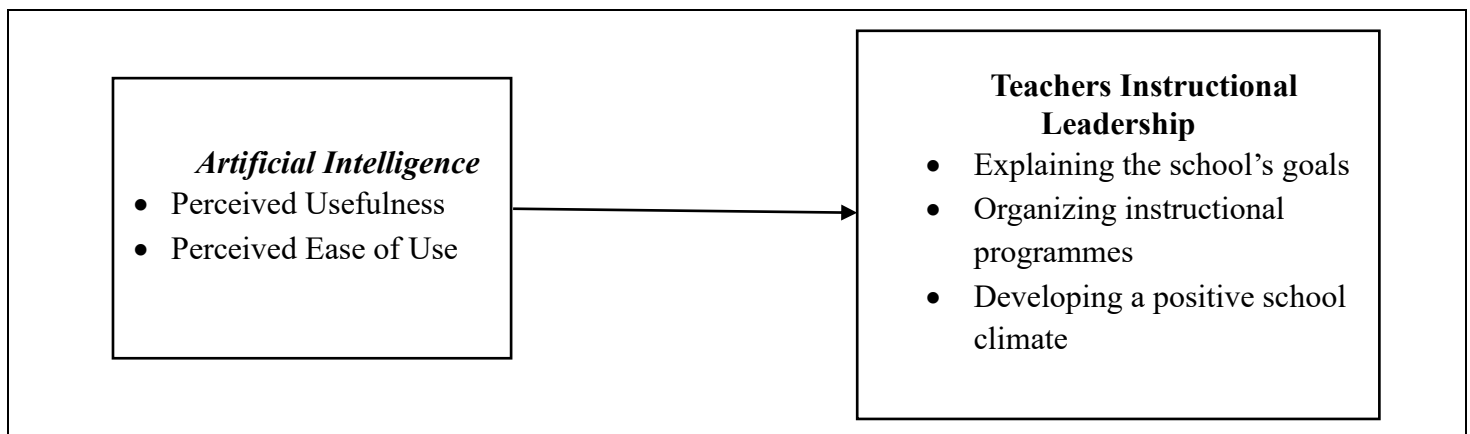
The following is the null hypothesis of this study:

H₀₁: There is no significant relationship between AI and the instructional leadership of secondary school teachers in Sabah.

Conceptual Framework

The conceptual framework for Figure 3 is to examine the relationship between Artificial Intelligence and the instructional leadership of secondary school teachers in Sabah. The conceptual framework in this study serves as the foundation for the researcher in conducting the study. This study consists of two variables, namely AI as the independent variable while teacher instructional leadership serves as the dependent variable. The AI variable is measured using the Technology Acceptance Model (TAM) developed by Fred D. Davis (1989) which encompasses two dimensions, namely perceived usefulness and perceived ease of use. Meanwhile, the variable of teacher instructional leadership is measured using the Instructional Leadership model developed by Philip Hallinger and Joseph Murphy (1985), which consists of three main dimensions that is explaining school goals, organizing instructional programs, and developing a positive school climate. Figure 3 below is the conceptual framework of the study, constructed as a suggestion to the researcher to explain the relationship between the variables in the study.

Figure 1: Conceptual Framework of the Relationship Between Artificial Intelligence and the Instructional Leadership of Secondary School Teachers in Sabah



Source: Fred D. Davis (1993) and Hallinger and Murphy (1985)

METHODOLOGY

Design and Research Methods

This study uses a non-experimental design and the method employed in this study is a quantitative survey method. The use of survey methods in this study aligns with Chua's (2006) view that such a design is appropriate for providing explanations related to the research questions to be examined. To obtain information related to this study from the research respondents, this study will use a questionnaire-based technique. In the questionnaire, instruments adapted from Fred D. Davis's instrument will be used. Davis (1989) and Philip Hallinger and Joseph Murphy (1985) will be used to represent and measure the variables of this study. The raw data that have been obtained will be analyzed using the Pearson Correlation test with the Statistical Package for Social Sciences (SPSS) software.

Research Location

The study conducted involves all districts in the state of Sabah, with a total of 24 District Education Offices (PPD) and 198 secondary schools in Sabah. However, this study only focuses on two schools for each PPD to meet the respondent size requirement of 375 respondents among secondary school teachers in Sabah.

Population and Sample of the Study

The population of this study comprised 15,231 teachers in Sabah from 198 daily secondary schools located within 24 District Education Offices in Sabah. Although there were 198 daily secondary schools in total, the researcher selected only two daily secondary schools to represent each District Education Offices in Sabah, resulting in a total of 48 schools included in the study. To determine the sample size, the researcher referred to the Krejcie and Morgan (1970) sampling table. From the total population of 15,231 teachers, only 375 teachers from daily secondary schools were selected as the study sample. The sampling method employed was simple random sampling. This sampling technique was adopted because it provides every member of the study population with an equal opportunity to be selected as a sample.

Validity and Reliability of the Research Instrument

Validity and reliability in this study are conducted to ensure that the items in the study questionnaire have a good level of validity and reliability. To ensure the validity and reliability of the items in the questionnaire, the researcher distributed the questionnaire instrument to 100 respondents in accordance with the recommendation of Coakes et al. (2010) that a sample size of more than 100 respondents is suitable for exploratory factor analysis (EFA). The raw data obtained from the pilot study will use the Statistical Package for the Social Sciences (SPSS) software to conduct EFA analysis to validate the research instrument that will be used in the actual study. Meanwhile, the reliability of the items will be analyzed using reliability analysis. To determine whether the items in the instrument have good reliability, the Alpha Cronbach value will be used as a guideline to assess the reliability of the items. Table 1 presents the results of the analysis on the Kaiser-Meyer-Olkin (KMO) Index and Bartlett's test for sample adequacy analysis, as well as the Alpha Cronbach value for item reliability analysis.

Table 1: Analysis of Validity and Reliability of the Instrument

No	Variable	KMO	Bartlett's (Sig)	Alpha Cronbach
	AI	0.83	0	0.94
	Teachers Instructional Leadership	0.94	0	0.98

Based on Table 1 above, it shows that the KMO value for the AI variable is .83 and the KMO value for the teacher's instructional leadership variable is .94. The values for both variables have exceeded the KMO value of .50. Additionally, the Bartlett test for both variables is at a significant level of .00. Meanwhile, the Alpha Cronbach values for this study's variables are at a high level, with the AI variable at .94 and the teacher's instructional leadership variable at .98. Field (2009) states that items with a minimum level of .50 and significant values are eligible for factor analysis. Therefore, the variables of AI and instructional leadership of teachers are suitable for conducting factor analysis.

RESEARCH FINDINGS

Ho1: There is no relationship between AI and the instructional leadership of secondary school teachers in Sabah.

Table 2 shows the findings from the Pearson correlation analysis conducted on the relationship between AI and the instructional leadership of secondary school teachers in Sabah. Based on the findings obtained in the table below, it shows that there is a significant relationship between AI and the instructional leadership of secondary school teachers in Sabah ($r=0.421$, $p<0.05$).

Table 2: The Relationship between AI and Instructional Leadership of Secondary School Teachers in Sabah

		Artificial Intelligence	Teachers Instructional Leadership
Artificial Intelligence	Pearson correlation	1	0.421**
Teachers Instructional Leadership	Sig. (2-tailed)		<0.001
	N	375	375

DISCUSSION

The research findings obtained from this implementation are in line with the findings of studies conducted by researchers both domestically and internationally. The presence of AI provides various advantages to teachers' teaching and learning practices (Noornee Razak and Helmi Norman, 2025). Through the acquisition of these findings, it shows an increase in the use of AI in teachers' instructional leadership, particularly in the aspects of lesson planning, the appropriateness of teaching strategies, and classroom management. The findings of the study are in line with the findings of Suguitan et al., (2026), where high proficiency in AI usage is related to high instructional leadership among teachers in the classroom because AI is a supportive tool that can further enhance the performance and effectiveness of teachers' instructional leadership in the classroom. Furthermore, a positive attitude in instructional leadership also plays an important role in the use of AI because a positive attitude will have a strong tendency to integrate AI into teaching and learning (Gustiana et al., 2026).

Furthermore, Rule and Comerros (2026), who also obtained similar findings to this study, explain in their research that teacher instructional leadership with a positive perception of AI will strive to produce effective work management and quality teaching. Thiviyasiny Saravanan and Nurul Aisyah Kamrozzaman (2025), in their study, found that AI has the potential to enhance the effectiveness of teaching practices and also supports teachers in making instructional decisions. The instructional decisions referred to in the study are related to the instructional leadership of teachers in planning, classroom management, content selection, and teaching strategies that align with the needs of the students.

Moreover, the study by Manikam et al., (2025) also supports the findings of this study, which explain that the integration of AI has the potential to empower teachers' instructional leadership through teaching and learning practices in the classroom. Therefore, the positive relationship between AI and teachers' instructional leadership can be interpreted as the more proficient teachers are in utilizing AI, the higher their ability to leverage technology, information, and digital resources for planning, implementation, and improvement of teaching practices.

CONCLUSION

Overall, this study shows a relationship between AI and instructional leadership among teachers in Sabah. The proficiency of teachers' instructional leadership in integrating AI helps them in lesson planning, preparation of teaching materials, and improving the teaching and learning process. Although this study has been conducted on the instructional leadership of teachers in Sabah, such studies need to be updated from time to time because the use of AI among teachers instructional leadership is important and has become a focus of the MOE in empowering the national education system. Therefore, AI-related programs and training are important to be implemented in the long term so that the instructional leadership competence of teachers toward AI continues to increase and they are able to apply expertise and skills into teaching practices.

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