The Mediating Role of Educational Organizational Commitment on the Relationship between Principals' Technology Leadership and Teachers' Self-Efficacy

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Abstract
The objective of this study was to evaluate the role of teacher self-efficacy as a deep mediator in the relationship between the principals' technology leadership and teachers' self-efficacy among secondary school teachers in the state of Sarawak. This quantitative study involved 406 randomly selected respondents from Sarawak. The study employed IBM-SPSS-AMOS 28.0's Structural Equation Modeling (SEM) method to model the interrelationship among the constructs, estimate the parameters, and test the hypotheses. The study found that educational organizational commitment mediates the relationship between principals' technology leadership and teacher self-efficacy among secondary school teachers in Sarawak. Furthermore, the study also found both indirect effects are significant. The type of mediation that occurred is full mediation since the direct effect is not significant. The results of this study provide important direction to policymakers in improving the national education system. The primary contribution of this study is to offer fresh insights into managing teachers' self-efficacy in the 21st century classroom environment. This study found that the principal's leadership is able to increase the commitment of the teacher in the classroom. This research also has several limitations that other authors can address in their future studies. It is recommended that future research incorporates more independent variables or mediating variables not explored in this study

Keywords: Educational Organizational Commitment, Principals' Technology Leadership, Teachers' Self-Efficacy, Structural Equation Modelling (SEM)

Introduction
The implementation of the Malaysian Education Development Plan (PPPM 2013-2025), which covered various dimensions in phases, has significantly changed the education system in Malaysia. The eleventh shift in PPPM 2013-2025 aims to maximize student success for each ringgit spent by the government. In this regard, the quality of knowledge and competence of teachers is seen as an implementing agent that becomes the main focus to ensure that the country's wishes can be realized (Yong *et al.,* 2018). The teacher's ability to convey knowledge and skills that meet the needs of students is related to the teacher's self-efficacy. The

teacher's confidence in designing and organizing teaching strategies is the starting point for learning innovation changes that are able to improve student achievement (Cocca, Cocca, Martinez and Bulnes, 2018). Thus, the aspect of self-efficacy must be present in every teacher to improve the quality and effectiveness of the country's education system. The emergence of students who are capable of becoming national assets and outstanding human resources is the result of teachers' success in providing quality education. Therefore, to produce quality students requires the best education from quality teachers. Teacher's self-efficacy is important to ensure that teachers have faith and confidence to be successful in the teaching process in the classroom and also in organizational management.

This study was conducted to understand the relationship between principals' technology leadership and teacher's self-efficacy with educational organizational commitment as a mediating factor. The lack of complete basic infrastructure, the issue of a shortage of qualified teachers, the problem of limited teaching material resources, and the most significant one is due to drastic curriculum changes among the issues that are often raised (Utusan Borneo Sabah, 2017). This indicator shows that teacher's self-efficacy in using ICT is still at a very high level (Hatlevik and Hatlevik, 2018). A report issued by Malaysia Educational Statistics, Quick Facts (2019) shows that the percentage of student achievement in the SPM examination from 2012 to 2016 has declined by 4.36 percent in a period of 5 years. This decline is quite worrying and this problem actually starts from the poor mastery of student learning in schools. Based on the PPPM 2013-2025 report, it was also found that the achievement of Malaysian students is also declining in the international assessment of the Programme for International Student Assessment (PISA).

It is important to note that the leadership skills of principals significantly influence the commitment of teachers and the effectiveness of a school (Jamalullail *et al.,* 2014). It is important for principals to focus on the organization's vision, goals, and direction, as well as the entire school's commitment to these goals. School leaders must also have knowledge and expertise in developing and managing the school and its structure in accordance with current needs and changes to achieve organizational goals (Mohd Yusri & Aziz, 2014). Principals' technology leadership plays an important role in creating a school environment that supports the use of technology. Principals who demonstrate technology leadership skills are able to provide strategic support to teachers in applying technology in the classroom. In addition, teachers' emotional intelligence is also an important factor because it affects teacher's ability to manage stress, adapt to change, and increase self-confidence in facing technological challenges.

In the context of an organization, Zuraidah and Mohamad Yusoff Mohd Nor (2018) assert that employees' commitment to the organization is crucial for achieving its goals. In the field education, commitment is one of the factors influencing a teacher's high or low performance. The relationship between teacher commitment behavior and student academic achievement, as well as school performance is well-established (Mohamad, Zakaria & Nasir, 2017). Lack of high commitment, responsibility, and weak self-efficacy will negatively impact educational goals. This is further reinforced by a study by Suhaili (2022), who explains that teachers' commitment to their duties shows better quality work performance than what was instructed.

It is believed that the commitment of teachers is very significant in ensuring the sustainability of school education, especially in terms of student achievement (Shuhaili, 2022). Organizational commitment is often a problem. Raman *et al.* (2015) point out that less committed teaching staff creates issues important to the school head and administration. On the other hand, dedicated instructors always prioritize the needs and benefits of their students and use a variety of innovative teaching strategies (Altun, 2017). In addition, loyal teachers will show their behavior through their attitude; that is, they will work harder to achieve the school's objectives. Less committed teachers, on the other hand, are more likely to engage in problematic behavior at work, such as bullying (Warr & Nielsen, 2018), and emphasize individual success more than organizational success (Bahkia *et al.,* 2019). Teachers are the most important component in the teaching and learning process, school activities, and academic success, so it is necessary to prioritize their dedication while considering the sustainability of school education.

This study adopted Meyer and Allen's model of organizational commitment, which defines three components: affective, continuance, and normative. High affective commitment among teachers motivates them to effectively contribute to the school organization, leading to positive correlations with work effort and performance (Riaz and Mahmood, 2017), and negative correlations with absenteeism, intention to leave school, work stress, and quitting (Cheol Young & Won-Woo, 2015; Demirtas & Akdogan, 2015). This commitment is the best way to enhance school effectiveness (Fu, Elliott, Mano, & Galloway, 2017). Employees who feel a strong desire to stay in the organization base their continuity commitment on their evaluation of the costs involved. Previous studies by Alsiewi *et al.* (2016) revealed a high level of continuous commitment among teachers to the organization. It was found that there is a positive relationship between continuous commitment and the school environment.

Normative commitment often revolves around moral principles and a person's sense of responsibility to the organization. According to Ross and Ali (2017) and Tosun and Ulusoy (2017), this normative commitment is associated with various work behaviors, as well as emotional commitment and determination to be good. According to the findings of a previous study by Hayat *et al.* (2015), instructors have high normative commitment. The level of normative commitment is high due to the ethics of teachers, who believe that the right action is to stay with the educational organization (Ibrahim and Iqbal, 2015). Therefore, school administrators need to know the needs of teachers and care about their welfare so that teachers feel valued and can then stay with the school while also being able to achieve the goals and effectiveness of the school.

In order to achieve the vision and goals of the educational organization, students are more likely to be highly motivated and committed to attend school (Mohamed Sani, Ghavifekr, Ling, Siraj, & Azeez, 2014), which increases creativity and reduces their intention to leave school institutions. According to various studies (Marshall, 2015; Osman & Siti Fatimah, 2014; Jamalullail *et al.,* 2014; Zacharo *et al.,* 2018), the dedication of teachers is strong. For example, Ibrahim *et al.* (2017) conducted a study on religious secondary schools in the state of Terengganu, which revealed a high level of organizational commitment. Suhaili's (2022) research, which examined teachers in fifteen secondary schools in Kelantan, also confirmed the high level of organizational commitment.

According to the 2018 Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA) results, Finland is still in the top ten. Additionally, the top 10 countries in mathematics, literacy, and science are Singapore, Japan, Korea, China, Macau, Hong Kong, Taiwan, Australia, Canada, Denmark, and Switzerland. However, some developing countries, including Malaysia, continue to perform below the required level on international tests such as PISA for 2018. This is entirely dependent on the caliber of teaching staff in these countries. Therefore, more careful attention should be given to the issue of organizational commitment in educational organizations, particularly when it involves teachers.

In another study, researchers found that the level of commitment among professors at Assumption University of Thailand is between medium and low (Cheasakul and Varma, 2016). The principal's leadership ability has a significant impact on teachers' commitment to school success (Jamalullail *et al.,* 2014). Based on the study of Maiti *et al.* (2020), both showed that teachers' organizational commitment has a significant effect on student achievement. There are possible reasons why some students perform poorly in international tests such as PISA. This is directly related to the level of commitment of teachers' organizations (Suhaili, 2022).

Studies by Abdul Kholik and Hady Siti Hadijah's (2018) clearly showed that organizational commitment increases the effectiveness of teachers in the organization. The results of these studies support De Jong's (2015) study, which showed a significant correlation between teacher dedication and self-efficacy. These data clearly revealed that teacher dedication has a great effect and is related to teacher self-efficacy. Based on the explanation above, the researcher is confident that the commitment of the educational organization impacts the relationship between the principal's technology leadership and the teacher's self-efficacy. Therefore, the study aimed to identify the mediating role of educational organizational commitment in the relationship between principal technology leadership and teachers' self-efficacy.

Findings for the study are very important as a source of knowledge and theory related to the field of management, especially educational organizations commitment, principals' technology leadership, and teachers' self-efficacy. This study benefits the policy makers and education management in providing rules or procedures as well as the capacity that a leader needs to have in managing and administering a school. The findings of this study should help teachers understand how these factors affect their level of self-efficacy and the steps that need to be taken to improve the aspects of each construct in teacher self-efficacy. Through this study, we will be able to fill the knowledge gap regarding the relationship between principals' technological leadership, educational organizational commitment and teachers' self-efficacy in the context of education in Sarawak.

Theoretical Framework

This study's theoretical framework incorporates three foundational theories: House's Goal Path Leadership Theory (1971, 1996), Meyer and Allen's Commitment Theory (1984), and Tschanen-Moran, and Hoy's Self-Efficacy Theory (2001). This study employed a theoretical framework that utilizes basic theory to examine the effect of educational organizational commitment as a mediator on the relationship between principal technology leadership and teacher self-efficacy.

Teachers' Self-Efficacy

Teacher self-efficacy denotes an individual's confidence in their ability to overcome challenges and issues, particularly within the teaching profession. Tschanen-Moran, Hoy, and Hoy (1998) defined teacher self-efficacy as the belief of a teacher in his own ability to organize and execute a series of actions required to accomplish a teaching task within a specific context. In other words, a teacher's self-efficacy refers to his belief in his own ability to teach in a teaching situation. This results in teachers with high teaching efficiency setting higher targets for their students (Allinder, 1995). Consequently, teachers possessing high self-efficacy must exert greater effort and maintain consistency in mastering their instructional techniques. On the other hand, teachers with low self-efficacy will try to avoid taking on challenging teaching tasks. Previously, research has established a relationship between teacher self-efficacy and technology, albeit in a distinctly different setting. Researchers (Isaac, Abdullah, Ramayah, and Mutahar, 2017; Nurul Shahhida Bakar *et al.,* 2020; Vargas, Suarez, and Ibanez, 2017) explored the utilization of ICT, internet, mobile learning, and TPACK. For example, the study of Joo *et al.* (2018) showed how teachers' self-efficacy interacted with TPACK directly to influence their behavior about technology use. Because of their technology use, teachers can be the best.

Principals' Technology Leadership

Technological leadership is the power and influence of leaders to create innovations that can improve the quality and effectiveness of schools, as well as the potential and capacity of organizational members, especially teachers and students, in line with development (Moktar, 2011). Technology leadership is essential to assess the abilities and expertise needed by school leaders and administrators to adopt technology, promote learning in the digital age, and transform the nature of education. The variable "Principal Technology Leadership" evaluates the principal's technology leadership within the school. It entails decisions made by the organization, rules, or activities that enable schools to effectively use technology. Eight indicators make up the "Key Technology Leadership" variable, including budgets, grants, intellectual policies, the number of days principals use technology, principals' email use, staff development policies, and technology committees (Anderson and Dexter, 2005). School administrators play an important role in embracing the latest developments and evolving into technology leaders. This is due to the fact that Principal Technology Leadership in schools today requires principals to manage change, which requires creativity, tenacity, and a willingness to adapt (Senge, 1990). Fullan (2001) found that of all the tasks played by school administrators, the principal's technology leadership has the broadest scope. Faridah and Mohd Izham (2017) conducted a study demonstrating how skilled principals are in technology leadership in curriculum management. The findings led them to conclude that the principals displayed a high degree of technological leadership. He stated that principals, as school leaders, must transition from conventional leadership practices to ICT-based leadership practices, also known as technology leaders, to improve academic performance and school effectiveness.

Educational Organizational Commitment

According to Rabindarang *et al.* (2014), organizational commitment is defined as a work environment and a sense of duty assumed by employees that can improve organizational performance. Teachers can do their work successfully and efficiently when they focus on it, which leads to self-awareness and personal fulfillment. Dedicated teachers

can enhance their self-confidence and task performance. Meyer and Allen (1997) defined workplace commitment as a psychological construct that indicates the relationship between the employee and the company and has consequences for the individual's decision to continue working there. According to the concept, committed employees are more likely to survive than non-committed members. Meyer and Allen (1984) divided organizational commitment into three parts: affective, continuance, and normative. Several theories suggest that the construct of organizational commitment influences and explains changes in the dependent variable of research. The use of the mediating factor of organizational commitment in the study can show that this construct has a role in explaining the relationship between the dependent variable and the independent variable of the study, even though the variables analyzed were different from the variables in this study. Other research studies, including Purnawati, Widyani, and Devy's (2021), also determined organizational commitment as a mediator of career development and employee performance. The analysis's findings showed that when organizational commitment acts as a mediator and improves service performance, there is a positive and significant relationship
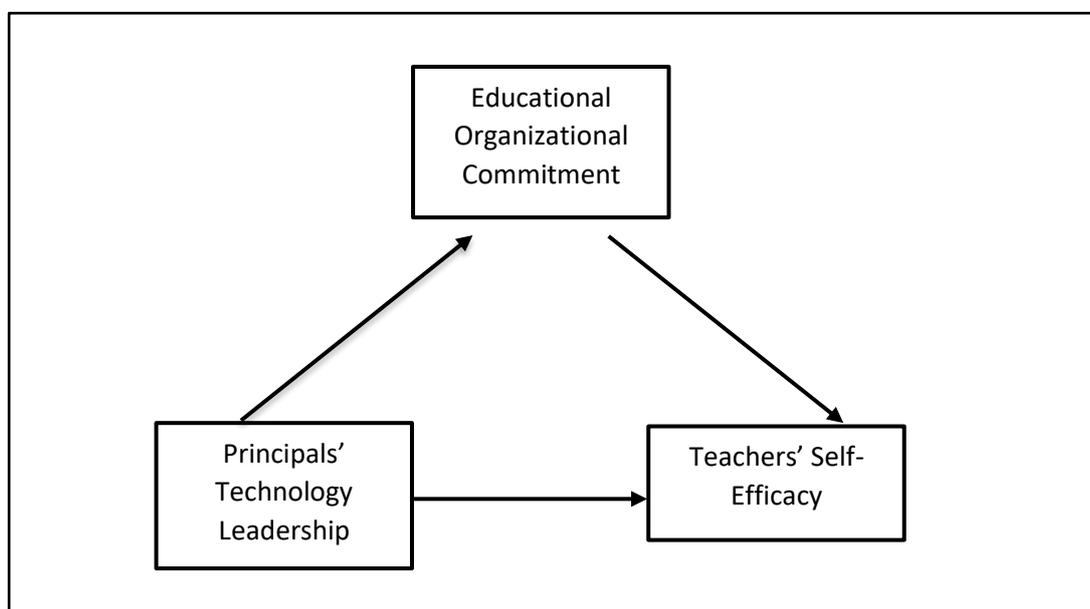

Figure 1. Conceptual Framework
Source: Processed data, 2025

Method

This study's target population was secondary school teachers in Sarawak. A stratified sampling technique was used to randomly select a total of 406 respondents from the sampling frame. The selected respondents were given a set of questionnaires to answer without any influence or pressure. The educational organization commitment instrument was adapted from the TCM Employee Commitment Survey instrument Allen and Meyer (1990), Principal Technology Leadership Assessment (PTLA) International Society for Education (ISTE) (2009), and Teachers' Sense of Efficacy Scale (TSES) (Tschannen Moran and Hoy, 2001). All instruments adapted and modified for this study were validated by experts in their respective fields. The theoretical framework in a study comprises a critical and organized analysis of the literature relevant to the topic, providing a theoretical contextualization and defining the key concepts. It must comprehensively incorporate theories, models, and prior research,

identifying gaps, contradictions, and consensuses in the literature that are crucial for the development of the work.

The analysis method used was Structural Equation Modelling (SEM) with IBM-SPSS-AMOS 28.0 software. The first stage of the analysis is to validate the model construct measurement via confirmatory factor analysis. Once all construct measurement models have achieved construct validity, convergent validity, discriminant validity, and composite reliability through the CFA method, the second stage will involve modelling the research construct in a structured model, specifically a structural model. This structured model will undergo modelling structured equations (structural equation modelling, or SEM), where all parameters will be estimated for use in hypothesis testing (Awang *et al.,* 2018, 2023).

Next, the recommendations of Baron and Kenny (1986) and Awang *et al.* (2018, 2023) were referred to in testing the mediation effect hypothesis in the model. According to Baron and Kenny (1986), there are several criteria to determine a relationship, whether there is a mediator influence or not (Figure 2):

a. In the first equation, the independent construct should be significantly influential to the mediator (path a).
b. In the second equation, the mediator construct should be significantly influential to the dependent construct (path b).
c. In the third equation, the influence of the independent construct on the dependent construct will be tested (route c)
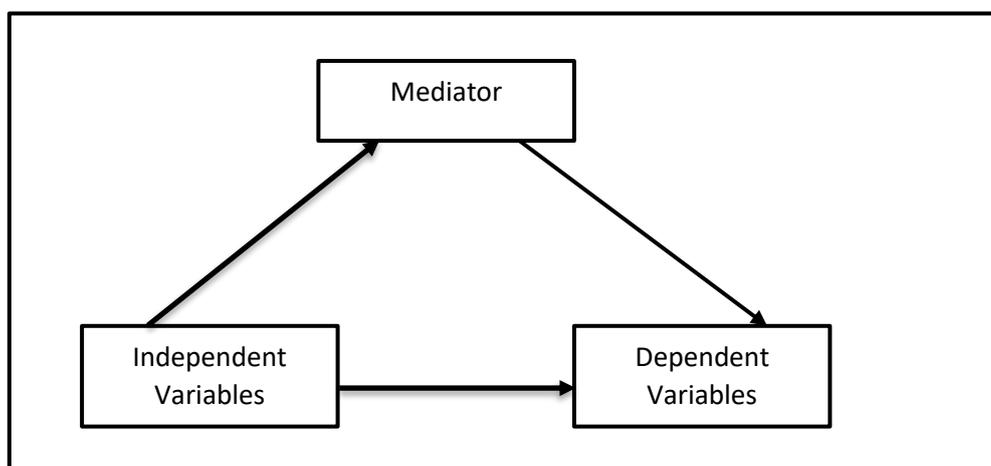

Figure 2. Procedure for Testing Mediating Variables as Mediators based on Baron and Kenny (1986)

Whereas, determining the type of mediator effect in a model based on Baron and Kenny (1986) and Awang *et al.* (2018, 2023) are:
a. Full mediation occurs when both indirect effects a and b are significant while the direct effect c is not significant.
b. Partial mediation occurs when both indirect effects a and b are significant while the direct effect c is also significant.

c.   No mediator effect occurs when one of the indirect effects a or b or both a and are not significant. If the above conditions occur then you can concluded that the mediator effect in the model is nonexistent.

This study used path analysis (SEM) to determine the direct and indirect influence between the independent construct and dependent constructs. Path analysis is used in researching causal relationships in a system of structural similarity (Baron & Kenny, 1986; Awang *et al.,* 2015, 2023). In this study, path analysis was employed to scrutinize the impact of mediating constructs on the relationship between independent and dependent constructs. As Awang *et al.* (2018, 2023) and Rahlin *et al.* (2023) say, path analysis is able to determine the influence of construct mediators on the relationship between predictor constructs and construct criteria in great detail. Research on the influence of mediating constructs between the relationships between constructs in a study using path analysis can increase the level of confidence in findings obtained. Hence, for this study, the hypothesis are as such:

Hypothesis:
H1 : Principals' Technology Leadership has a significant impact on educational organizational commitment among secondary school teachers in Sarawak.
H2 : Educational organizational commitment has a significant impact on self-efficacy   in secondary school teachers in Sarawak.
H3 : Principals' technology leadership has a significant impact on self-efficacy of secondary school teachers in Sarawak.

Findings And Discussion

Based on path analysis in SEM using IBM-SPSS-AMOS 28.0 software, it appears that educational organizational commitment was a mediator in this study. This type of mediation is called full mediation. According to Awang *et al.* (2018, 2023) hypothesis testing to obtain the mediator effect of educational organizational commitment on the relationship between principal technology leadership and teacher self-efficacy, then the value of the standardized coefficient (standardized regression weights) and the probability value (p-value) that show significance for each path need to be obtained first. Next, the information (p-value) was given as in Table 1. After that, a sketch of the triangular shape required to test the mediator was drawn, as shown in Figure 2.

Table 1
Three Sub-Hypotheses are Involved in each Mediator Test

Hypothesis Statement for Path Analysis (Three sub-Hypotheses	Estimate	P-Value	Hypothesis Result
H1 : Principals' technology leadership has a significant effect on the educational organizational commitment	0.399	0.001	Supported
H2 : Educational organizational commitment has a significant effect on teachers' self-efficacy	0.530	0.001	Supported
H3 : Principals' technology leadership has a significant effect on teachers' self-efficacy	0.154	0.024	Not Supported

Table 2 shows the principals' technology leadership construct of the path of educational organizational commitment in standardized regression at 0.343 p-value 0.001*** significant. The same goes for the path of educational organizational commitment construct towards the teachers' self-efficacy standardized regression at 0.370 p-value at 0.001***significant. Nonetheless, the path analysis of the principals' technology leadership construct to the teachers' self-efficacy standard regression on 0.067 p-value 0.312 exhibited a non-significant result.

Table 2
Standard Regression Coefficients and their Significance for Each Path

Hypothesis Statement for	Path	Construct	Standard Regression	P-Value	Results
Educational organizational commitment	←	Principals' technology leadership	0.399	0.001***	Significant
Teachers' self-efficacy	←	Educational organizational commitment	0.530	0.001***	Significant
Teachers' self-efficacy	←	Principals' technology leadership	0.154	0.024	Not significant

The results of the mediator test in Figure 3 indicate that the indirect effect of principals' technology leadership on educational organizational commitment was 0.343, while the effect on educational organizational commitment towards teachers' self-efficacy was 0.370, with an indirect effect of 0.164.
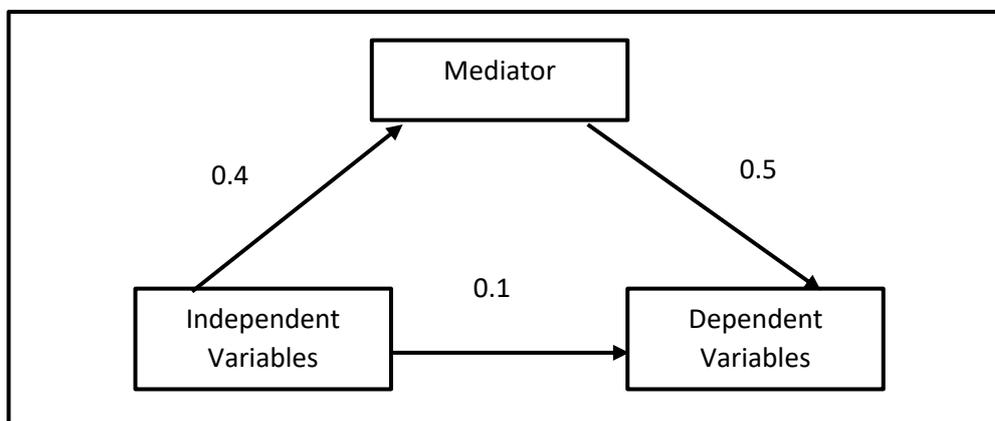

Figure 3. Mediator testing procedures in complex models

i.   Indirect effects = 0.40 x 0.53 = 0.212
ii.   Direct effects = 0.15
iii. Indirect effects > The direct effect mediator effect exists
iv.   Both indirect paths were significant
v.   The type of mediation here was full mediation because the direct effect was not significant

As can be seen, principals' technology leadership yielded direct effects on teacher self-efficacy. The findings of the study are also shown in Figure 2, which revealed that the indirect

effect was greater than the direct effect. The findings concluded that a mediator effect existed (Awang *et al.,* 2018, 2023; Rahlin *et al.,* 2023). The study also found that both indirect paths were significant. Therefore, it can be concluded that the type of mediation in this case was a full mediator, as the direct effect was not significant (Baron & Kenny, 1986; Awang *et al.,* 2018, 2023).

The analysis also determined that educational organizational commitment affects teachers' self-efficacy. The analysis showed that principals' technology leadership had a significant impact on educational organizational leadership. Therefore, the findings of this mediator satisfied the conditions for determining the mediator variable, as established by Baron and Kenny (1986) and Awang *et al.* (2018, 2023).

Conclusion
This study clearly demonstrates that the principal's technology leadership significantly influences the teacher's self-efficacy, thereby enhancing their ability to implement effective teaching and learning in the classroom through high self-efficacy. Next, the results support the findings of previous studies. This research has several limitations that can be overcome by other authors in future research. It is recommended that future research incorporate more independent variables or moderating variables not explored in this study.

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