

Trends and Factors Affecting Self-Efficacy among Teachers: A Systematic Literature Review

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Abstract

The study of the teacher's self-efficacy trend as the foundation in the development of thoughts, feelings, and self-behavior is seldom discussed. The factors affecting self-efficacy are also detrimental to efforts to identify and make changes to the teaching and learning process. Thus, a Systematic Literature Review (SLR) is conducted to investigate the trend of self-efficacy research based on the type of schools, research approach, sampling techniques, and national context. The most dominant factors in influencing the self-efficacy of teachers' teaching and learning practices were also studied. Scopus, ERIC, and Google Scholar databases were used in the article process. This study uses the PRISMA Model in implementing the screening of article selection which involves four phases. The four phases are Identification, Screening, Eligibility, and Included. 31 relatable articles were chosen that were published between 2017 till 2022. The findings show that the quantitative approach, secondary school context, simple random sampling technique, and Malaysia exhibited the highest trend. Meanwhile, demographic factors and technological skills factors are most dominant in affecting the self-efficacy of a teacher. The implication of this research is able to provide the necessary push for future studies to identify techniques and interventions that are successful in strengthening the self-efficacy of teachers in line with the education transformation.

Keywords: Self-Efficacy, Mathematics Teacher, Demography, Technological Skill, SLR, Research Trend

Introduction

Bandura (1986) debated that self-efficacy is a belief and self-confidence based on the ability in arranging and executing actions based on various situations. Teachers are the main agents to shape and develop students with superior thoughts in line with the Industrial Revolution 4.0. The quality of teaching and learning aspects are affected by the level of teachers' self-efficacy towards self-confidence and trust towards self. The mastery of knowledge and experience in teaching is an indicator of teachers' efficacy in teaching and learning practice. The desire highlighted through Malaysian Development Education Plan (PPPM) 2013-2025 is to increase competitiveness, quality, and of national education. In return, students with high skills and superior marketability can be developed.

The implementation of this study has its own importance for self-efficacy through the study approach, institutional context, sampling technique, and national context. Its purpose

is to provide a clear picture and thorough information to the responsible bodies, especially the Malaysian Ministry of Education, about the most dominant factors that affect the self-efficacy of teachers' teaching and learning practices, be it physical teaching or virtual teaching. Extensive monitoring can be carried out and assist the Ministry of Education of Malaysia to study and improvise the curriculum and in-Service Training in order to improve teachers' self-efficacy. Development aspects and a more progressive and proactive counseling unit execution in education organizations can help teachers to elevate the ever-fading self-efficacy due to restructuring and the education sector is heavily burdened with tasks other than teaching.

The importance of the implementation of this study in clearly displaying the trends found in the research of self-efficacy among teachers. This is to reveal how important this study is for researchers in focusing on self-efficacy research among teachers. In addition, this study also discusses the most dominant factors in influencing the self-efficacy of teachers' teaching and learning practices. The importance of such studies in providing an overview and prediction of the relationship between self-efficacy and teachers' teaching and learning practices.

Thus, this Systematic Literature Review (SLR) is carried out with reference to "*Preferred Reporting Items for Systematic review and Meta-Analysis*" (PRISMA) (Page et al, 2021). SLR research is a method that allows classifying to happen in detail in order to obtain information and trend that exist in each relevant article. SLR is conducted to obtain answers for the following research objectives

1. Identify self-efficacy research trends for teachers' teaching and learning practices based on the type of schools, research approach, sampling techniques, and nation.
2. Identify the most dominant factors affecting self-efficacy towards a teacher's teaching and learning practice.

Bandura (1977) is the person who introduced the concept of self-efficacy which falls under the Social Cognitive Theory. Liang & Tai (2021) defined self-perception expectation, performance or impression, and abilities that exist in an individual. Meanwhile, Tschannen-Moran et al (1998) explained that self-efficacy is the teacher's confidence in the ability to determine and implement actions to fulfill the teaching process in addition to positive attitudes and behaviors. Self-efficacy also means teachers' confidence to push themselves to achieve goals and objectives in teaching and learning practices (Che Sulaiman & Wahab, 2017). Therefore, the findings of the context of this study concluded that self-efficacy means trust and confidence in oneself in carrying out actions without any doubt.

Through a high level of efficiency, teachers can carry out teaching and learning without much difficulty. The lack of self-efficacy is a factor for an individual to be skeptical towards reform by seeing reform as a big obstacle that has to be overcome (Ashton, 1984). Therefore, the ability to encourage individuals to be confident is being able to make them perform and carry out their responsibilities well and effectively in achieving the targeted goals. Dasan and Nawi (2020) argued that job satisfaction is influenced by a high level of teachers' self-efficacy. Handayani et al (2021) also asserted that self-efficacy is an indispensable attribute that must be present in oneself to drive for a better education system.

Research Methodology

Systematic Review Protocol – PRISMA

This systematic literature review method is analyzed with reference to the PRISMA frame flowchart for screening journal articles (Moher et al., 2009). The framework flow of PRISMA

is comprised of four processes towards article selection which are identification, Screening, Eligibility, and Included (Zainuddin & Iksan, 2019). PRISMA guidelines help to improve the quality of reporting in synthesizing articles that have been published through systematic literature review. The past studies that applied PRISMA include Rahmanet al (2021); Pahmi et al (2022) as well as (bin Mohamed et al., 2022).

a) Identification Phase

Articles are searched using the technique of building a search string which is 'phrase searching' and 'boolean operator' is more focused on the research scope that is done in the journal search database. Through the search technique performed, keywords are then listed to build a search network to obtain articles related to the topic of systematic literature review. Searches were conducted in three databases to find and identify relevant articles through searches in ERIC, Scopus, and Google Scholar using Malay and English, which are the two languages of instruction. This selection is based on easy-to-be-understood language for SLR studies.

The selection of Scopus is based on increased searches in the database which globally challenges the dominance of the WOS database (Zhu & Liu, 2020). Meanwhile, Google Scholar was chosen because it is able to develop an important resource for publicly available documents covering various languages and disciplines where it can provide excellent publications online efficiently and effectively (Gusenbauer, 2019). For ERIC, it is able to provide various types of publications such as journal articles, books, conference papers, theses, and others including partially accessible full-text materials (Gillette et al, 2018).

As a result of the search, a total of 17920 related articles were obtained. 3434 were from the ERIC database, 31 from the Scopus database, and 17900 from the Google Scholar database based on the keywords in Table 1.

Table 1

Keywords used for searching the article

Database	Keywords
ERIC	Teachers' Self-Efficacy
Scopus	TITLE-ABS-KEY ("self-eficacy")
Google Scholar	Teacher self-eficacy+factor demography, teacher self-eficacy, teaching and learning practice

b) Screening Phase

For this phase, the selection of articles is conducted based on the criteria that have been set. The screening process for identifying journal articles takes into account the publication year of the latest 5 years, which is from 2017 to the beginning of 2022. The purpose of setting the publication year is to obtain relevant and appropriate information according to current needs and issues. In addition, the journal selection criteria also exclude journals (literature review), books, chapters in books, proceedings, project papers, and conferences.

Articles that do not use Malay and English are dropped. Therefore, a total of 21209 articles were excluded for not meeting the article selection criteria. Through inclusion and exclusion criteria, 156 articles were selected for eligibility-level screening based on the table below.

Table 2

Inclusion and exclusion criteria

Criteria	Qualifications	Exceptions
Kinds of Literature	Journal (Research Articles)	Journals (Literature Review), books, book chapters, proceedings, project papers, conferences
Language	Malay Language, English Language	Languages other than Malay and English
Years	2017 to early 2022	Before 2017
Research Location	in the country and abroad	-

c) Eligibility Phase

For this phase, each article is carefully screened by referring to the content of the article that remained from the identification phase. Articles are then screened by reading the title, abstract, and focus of the study which leads to trends and factors on self-efficacy among teachers. As a result, a total of 31 articles were identified for systematic literature review.

d) Included Phase

A total of 31 articles have met the set criteria. The diagram below shows the PRISMA flow chart in explaining the article selection process for systematic literature highlights.

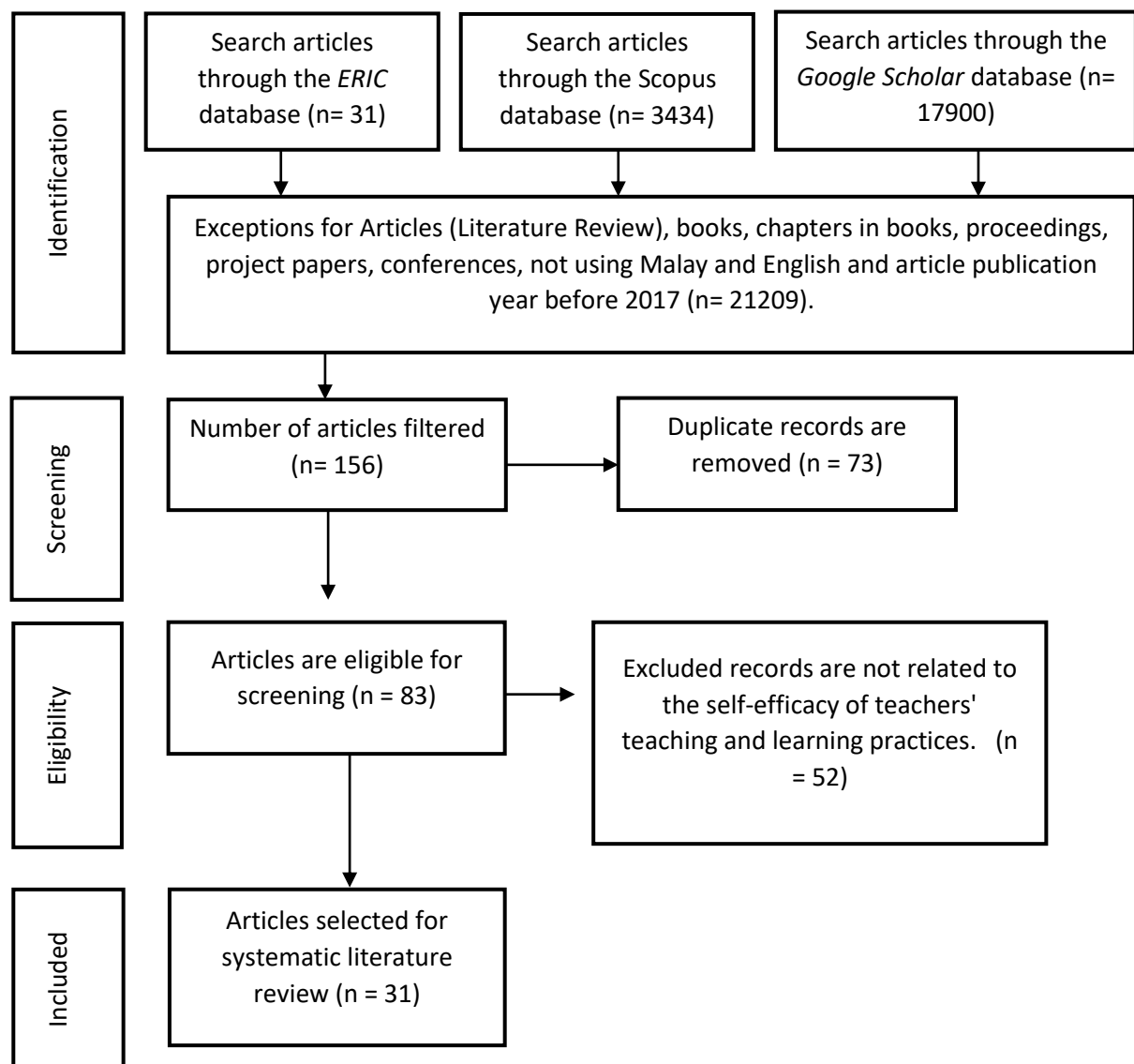


Figure 1: PRISMA Flow Diagram Picture adapted from Page et al (2021)

Research Findings

a) Article Collection and Analysis Process

A total of 31 articles were obtained through the Scopus, ERIC, and Google Scholar databases through the final screening of the PRISMA flow chart and then collected using Microsoft Excel 2016. The data collected aims to extract information such as the title of the study, the name of the author, the year of article publication, the study approach, the type of school, sampling techniques, and factors affecting teachers' self-efficacy. The data that has been analyzed is then displayed through bar graphs and tables. The analysis is performed on the article through the process of acceptance and rejection based on the criteria that have been set. Table 2 displays the name of the author and the year of publication, the type of school, and the title of the selected research article.

Table 2

Summary of Analysis of Systematic Literature Highlight Articles

Bil	Penulis	Tahun	Jenis sekolah
1	Tarmizi & Mahmud	2022	Secondary school
2	Bakar & Amat	2022	Primary and Secondary school
3	Hamzah & Ishak	2022	Secondary school
4	Odanga et al	2022	Secondary school
5	Ramayah et al	2022	Primary School
6	Yusof & Yaacob	2022	Secondary school
7	Akman	2021	Pre School, Primary and Secondary School
8	Cardullo et al	2021	Pre School, Primary and Secondary School
9	Ma et al	2021	Primary and Secondary school
10	Hamzah & Ishak	2021	Secondary school
11	Rahmadani & Kurniawati	2021	Primary School
12	Taul et al	2021	Secondary school
13	Tawan et al	2020	Primary School
14	Amatan & Han	2020	Secondary school
15	Lee & Lim	2020	Primary School
16	Bakar et al	2020	Secondary school
17	Amatan & Han	2019	Secondary school
18	Jongkulinet al	2019	Pre School
19	Jaafar	2019	Secondary school
20	Putwain et al	2019	Secondary school
21	Wu et al	2019	Secondary school
22	Infurna et al	2018	Pre School
23	Hassan & Thambu	2018	Secondary school
24	Neto et al	2018	Pre School, Primary and Secondary School
25	Reaves & Cozzens	2018	Pre School, Primary and Secondary School
26	Wilson et al	2018	Primary School
27	Cayirdag	2017	Primary and Secondary school
28	Lailiyah & Cahyono	2017	Secondary school
29	Türkoglu et al	2017	Pre School, Primary and Secondary School
30	Alhassan	2017	Pre School, Primary and Secondary School
31	Yahaya et al	2017	Secondary school

b) Research trends based on the type of school, research approach, sampling methods, and nation

In this study, the type of school is the determining factor for the selection of respondents. The results of the analysis show that there are four categories of school types for the study. The categories are preschool, primary school, secondary school, primary and secondary school, and preschool to secondary school. Findings show that secondary school is the most dominant

type of school selected which is with 15 studies (Amatan & Han, 2019; Yahaya et al., 2017; Bakar et al., 2020; Taul et al., 2021; Hamzah & Ishak, 2022; Tarmizi & Mahmud, 2022; Amatan & Han, 2020; Jaafar, 2019; Hassan & Thambu, 2018; Yusof & Yaacob, 2022; Wu et al., 2019; Hamzah & Ishak, 2021; Odanga et al., 2022; Putwain et al., 2019; Lailiyah & Cahyono, 2017). While for the preschool, primary school, and secondary school levels, there are 6 studies, followed by 5 studies for primary school, and 3 studies for primary and secondary school. Studies at preschools are not commonly conducted with only 2 studies (Jongkulin et al., 2019; Infurna et al., 2018).

The research approach is one of the methods that need to be stated and set in order to obtain the data to be analyzed. The table below shows the number of frequencies for research approaches that are qualitative, quantitative, and combined approaches in the journal articles. The results of the classification show that quantitative research is the most used as many as 28 articles, followed by qualitative studies as 2 articles were identified. Only 1 article uses a combined research approach that is using qualitative and quantitative in the study (Lailiyah & Cahyono, 2017).

Table 3

Self-efficacy research trends for teachers' teaching and learning practices based on research approaches

Research Approaches	Number of Articles	Author
Qualitative	2	Lee & Lim 2020; Cardullo et al. 2021.
Quantitative	28	Amatan & Han 2019; Akman 2021; Yahaya et al. 2017; Bakar et al. 2020; Türkoglu et al. 2017; Ramayah et al. 2022; Taul et al. 2021; Jongkulin et al. 2019; Hamzah & Ishak 2022; Tarmizi & Mahmud 2022; Bakar & Amat 2022; Amatan & Han 2020; Jaafar 2019; Infurna et al. 2018; Tawan et al. 2020; Hassan & Thambu 2018; Yusof & Yaacob 2022; Wu et al. 2019; Hamzah & Ishak 2021; Odanga et al. 2022; Putwain et al. 2019; Rahmadani & Kurniawati 2021; Neto et al. 2018; Cayirdag 2017; Wilson et al. 2018; Reaves & Cozzens 2018; Alhassan 2017; Ma et al. 2021.
Mixed Method	1	Lailiyah & Cahyono 2017.

The purpose of sampling is to obtain information from the groups that were involved in the research. Figure 2 summarizes that the simple random sampling method is mostly used with 24 articles. For proportional stratified randomization, there are four studies using this sampling technique, namely (Amatan & Han, 2019; Hamzah & Ishak, 2022; Amatan & Han, 2020; Odanga et al., 2022). Meanwhile, there are two studies using cluster random sampling which are studies by (Jaafar, 2019; Tawan et al., 2020). Only one study used purposive sampling which is by (Lailiyah & Cahyono, 2017).

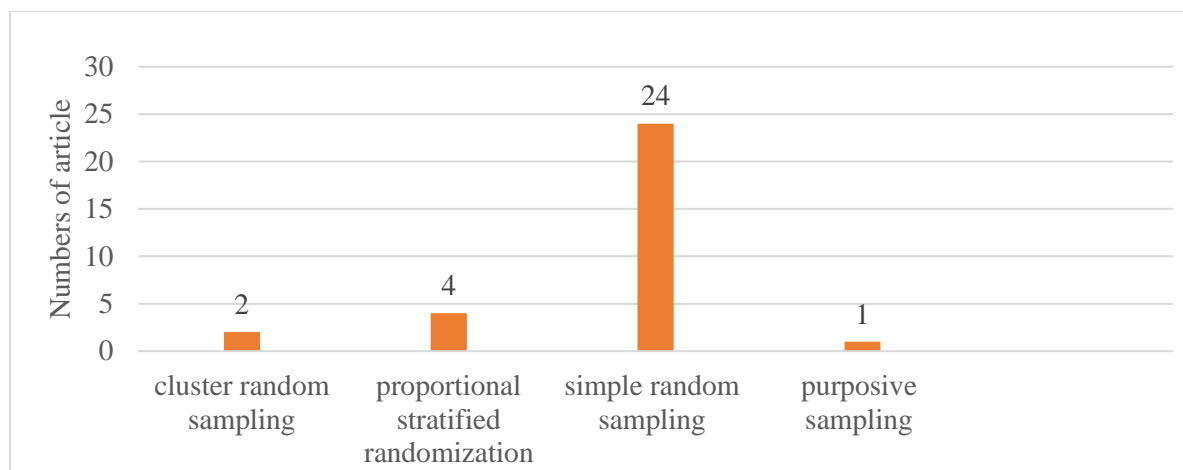


Figure 2: Self-efficacy research trends for teachers' teaching and learning practices based on sampling method

Next, Malaysia is the country with the highest number of studies on teacher self-efficacy (Amatan & Han, 2019; Yahaya et al., 2017; Bakar et al., 2020; Ramayah et al., 2022; Taul et al., 2021; Jongkulin et al., 2019; Hamzah & Ishak, 2022; Tarmizi & Mahmud, 2022; Bakar & Amat, 2022; Amatan & Han, 2020; Jaafar, 2019; Tawan et al., 2020; Hassan & Thambu, 2018; Yusof & Yaacob, 2022; Hamzah & Ishak, 2021) followed by the United States, China, Indonesia, Saudi Arabia, and others.

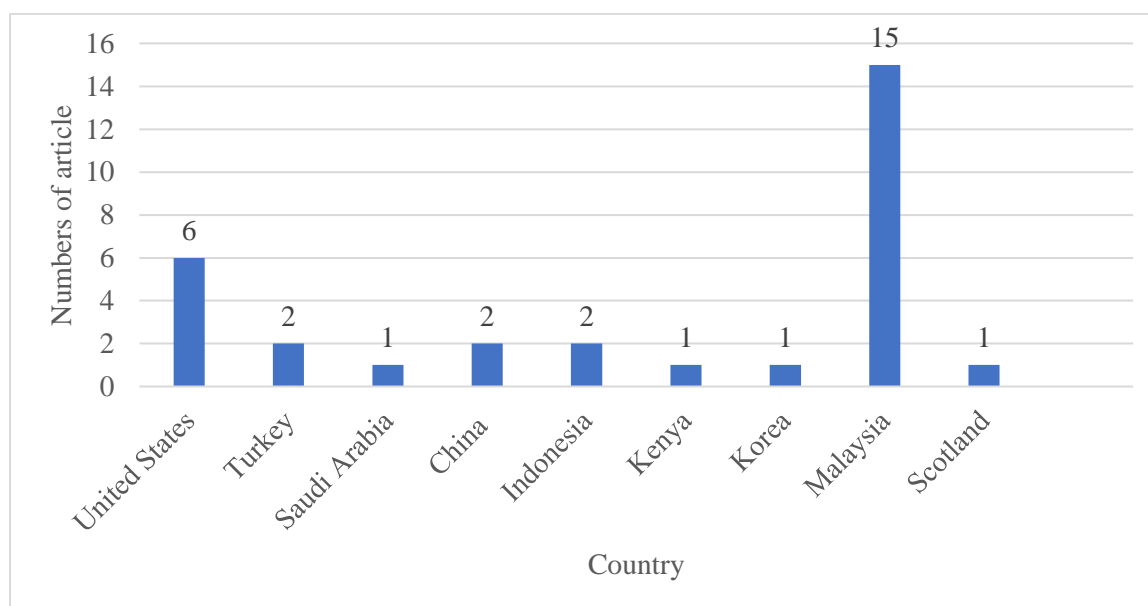


Figure 3: Self-efficacy research trends for teachers' teaching and learning practices based on the national context

c) Factors of Self-Efficacy for Teachers

Table 4 shows the list of self-efficacy factors for teachers in teaching and learning practices. Demographic factors show the highest frequency for self-efficacy studies with 11 studies (Yahaya et al., 2017; Amatan & Han, 2020; Jaafar, 2019; Infurna et al., 2018; Hassan & Thambu., 2018; Yusof & Yaacob, 2022 ; Neto et al., 2018; Cayirdag, 2017; Alhassan, 2017; Ma et al., 2021; Cardullo et al., 2021). Demographic factors are widely discussed in the study towards gender, age, teaching experience, teaching location, and teacher's professional qualifications.

Next, technology skills depict the second highest frequency with 7 studies (Lee & Lim 2020; Bakar et al., 2020; Yusof & Yaacob, 2022; Alhassan, 2017; Ma et al., 2021; Cardullo et al., 2021; Lailiyah & Cahyono, 2017). Job satisfaction ranked third with 6 studies whereby 2 studies were conducted in the United States (Infurna et al., 2018; Reaves & Cozzens, 2018), 2 studies in Malaysia (Bakar & Amat, 2022; Tawan et al., 2020). While for Turkey (Türkoglu et al., 2017) and Korea (Lee & Lim, 2020) only one study was carried out respectively.

Classroom management also contributes to teachers' self-efficacy, as shown in 5 studies (Rahmadani & Kurniawati, 2021; Odanga et al., 2022; Jaafar, 2019; Yahaya et al., 2017; Akman, 2021) as well as 4 studies based on the school's psychosocial environment (Amatan & Han, 2019; Zaki & Izwan 2022; Wilson et al., 2018; Reaves & Cozzens, 2018). Meanwhile, 3 studies look into leadership style (Hamzah & Ishak, 2022; Akman, 2021; Taul et al., 2021) and social support (Ramayah et al., 2022; Bakar & Amat, 2022; Hamzah & Ishak, 2021). 2 studies focus on work performance (Akman, 2021; Wu et al., 2019) and teachers' attitudes looks at 2 studies (Jongkulin et al., 2019; Neto et al., 2018). Academic qualifications (Bakar et al., 2020), motivation (Tawan et al., 2020) as well as curriculum changes (Putwain et al., 2019) are the least studies to be carried out with only one study.

Table 4
The most dominant factors in influencing the self-efficacy of teachers' teaching and learning practices

Factors articles	Technology Skills	Job satisfaction	School Psychosocial	Leadership style	Work Performance	Classroom management academic qualifications	Social Support	Teacher attitude	Demographics	Motivation	Transformation Curricular
Lee & Lim (2020)	X	X									
Amatan & Han (2019)			X								
Akman (2021)				X	X	X					
Rusliza et al (2017)						X			X		
Bakar et al (2020)	X						X				
Muhammet et al (2017)		X						X			
Ramayah et al (2022)							X				
Taul et al (2021)				X							
Mohammad et al (2019)											
Hamzah & Ishak (2022)											

Tarmizi & Mahmud (2022)		X				
Bakar & Amat (2022)	X			X		
Amatan & Han (2020)						X
Jaafar (2019)			X			X
Infurna et al (2018)	X					X
Tawan et al (2020)	X					X
Hassan & Thambu (2018)						X
Yusof & Yaacob (2022)	X					X
Wu et al (2019)			X			
Hamzah & Ishak (2021)		X		X		
Odanga et al (2022)			X			
Putwain, D. W. et al (2019)						X
Rahmadani & Kurniawati (2021)			X			
Neto et al (2018)					X	X
Cayirdag (2017)						X
Wilson et al (2018)		X				
Reaves, & Cozzens (2018)	X	X				
Alhassan (2017)	X					X
Ma et al (2021)	X					X
Cardullo et al (2021)	X					X

Lailiyah & X Cahyono (2017)													
Total article	of 7	6	4	3	2	5	1	3	2	11	1	1	

Research Discussion

First Research Objective : Identify self-efficacy research trends for teachers' teaching and learning practices based on the type of schools, research approach, sampling techniques, and nation.

a) Type of School

The results show that most studies were conducted in secondary schools. This study majorly focuses on secondary schools to obtain information on the self-efficacy of teachers. Secondary schools are in the limelight of the research trend because the pedagogical skills and knowledge as well as high curriculum content affect the self-efficacy of secondary teachers in implementing teaching and learning in the classroom. The different levels of primary and secondary curricula become the sub-factors that affect teachers' self-efficacy. The study focuses more on secondary schools than primary schools due to the higher level of education and higher discipline. The implementation of this study also helps and displays the results for secondary school teachers in determining the teacher's self-efficacy, which is on a worrying trend.

b) Research Approach

As for the research approach, it shows that 28 out of 31 studies (90.32%) are quantitative approaches. The selection of quantitative methods is because it is classified as the most impactful approach in obtaining information that meets the needs based on minimal resources (Konting, 1993; Amatan & Han, 2019). The quantitative approach that is most often used in the basis of each study is a method of collecting data, data analysis, and interpretation based on data analysis to obtain information to conclude and provide research results (Solimun, 2018; Santoso & Madiistriyatno, 2021). Quantitative approaches are most often used in studies that can be measured and data in numerical form can be analyzed through statistics where the assessment is more objective and unbiased (Stockemer et al., 2019). The quantitative approach is suitable to be used compared to other approaches because it can collect some information about the study phenomenon at a given time frame (Creswell, 2014; Idris, 2013; Omar & Ismail, 2019).

c) Sampling Techniques

The sampling technique is a method of determining the number of respondents in a population. The results of the findings explain that the random sampling technique is easy to use based on a large number of respondents. The selection of techniques is based on the focus to provide equal opportunities for respondents to be selected as study respondents (Bakar et al., 2020). This technique is the most frequently used approach because respondents are chosen fairly and the number of respondents can represent the population to be studied.

d) Nation

Malaysia is at the top of the list when it comes to carrying out the most studies on self-efficacy in a 5-year period. The results of the SLR analysis show that 15 out of 31 (48.39%) articles

were published in Malaysia. This shows that Malaysia takes a serious view of the level of self-efficacy of teachers in ensuring the direction of a highly prestigious education system. Maulod et al (2017); Taul et al (2021) discuss that to achieve excellent schools level, effective teaching attitudes and careers occur with confidence and high self-efficacy.

Second Research Objective: Identifying the most dominant factors in influencing the self-efficacy of teachers' teaching and learning practices.

Looking at the influence of teachers' self-efficacy, it can be deduced that demographics contribute to the most dominant factor in influencing self-efficacy in teachers' teaching and learning practices. Gender is the main aspect studied in determining the significance or relationship to self-efficacy (Yahaya et al., 2017; Amatan & Han, 2020; Jaafar, 2019; Infurna et al., 2018; Hassan & Thambu, 2018; Yusof & Yaacob, 2022; Neto et al., 2018; Cayirdag, 2017; Alhassan, 2017; Ma et al., 2021; Cardullo et al., 2021). Amatan & Han (2020) have reported that there is no significant difference in self-efficacy between male and female teachers. In addition to gender, teaching experience was also mentioned as one of the demographic characteristics studied. Maturity and teaching experience are also aspects that can influence a teacher's self-efficacy. Experience provides a different impact on teaching effectiveness levels, attitudes, and teaching practices throughout the service. The difference in experience that constrains the development of teachers' efficiency has been shown in this study (Yahaya et al., 2017; Amatan & Han, 2020; Hassan & Thambu, 2018; Cayirdag, 2017).

Next, the second highest dominant factor is technology skills with 7 studies. Nowadays, technology skills have become one of the most important aspects of sustainability in the world of education. That aspect underlies the teacher's ability to apply technology resources in teaching and learning practices to be more effective. This is a concern for teachers who are not confident and have low abilities and are less sensitive to the use of Information and Communication Technology (ICT) that has been provided in the classroom as an effective teaching facilitator. The application of ICT should not become an obstacle to increasing self-efficacy as teachers can increase their ability and adaptation towards ICT in forming an interactive and effective teaching process (Krause et al., 2017; Lailiyah & Cahyono, 2017; Omar & Ismail, 2019).

Conclusion

Findings show that secondary schools are the center of attraction for this study compared to primary schools. Besides that, the quantitative research approach and simple random sampling are mostly conducted in studies involving teachers' self-efficacy. Malaysia is the country whereby most studies involving teachers' self-efficacy are conducted to improve the quality of education in line with the changes in policies according to the time. This study can divulge that high self-efficacy can lead to quality education. This is because motivation and teachers' confidence lead teachers to face the realm of education which eventually leads to the Industrial Revolution 4.0. Appropriately, education is the main pillar in developing a country. This is clearly stated in the National Philosophy of Education which focuses on education as the core of developing potential in a wholesome manner for every individual. As the main body involved, the Ministry of Education must be alert to the importance of high self-efficacy among teachers in developing an education system with the utmost quality.

The limitation of the article includes that most articles were selected randomly from within the country and overseas based on primary school teachers and secondary school teachers. A suggestion for improvement in the future is by conducting screening and scaled

counseling in improving the self-efficacy of teachers. The recommendation for further research is that the Malaysian Ministry of Education can formulate and implement a Self-Efficacy Improvement Program among teachers to ensure teachers' confidence and motivation as well as high enthusiasm for the task of educating students.

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