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Teacher Teaching Practices Based on the PDCA Model: A Systematic Literature Review

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Abstract

This systematic literature review was conducted critically and aimed to analyse and synthesise published articles containing the introduction to the teachers' teaching practices based on the PDCA model in the last ten years is 2013 to 2022. There are six databases: Academia, books, proceeding paper, Google Scholar, Semantic Scholar and Research gate. Accordingly, 3 themes were identified: introduction to the PDCA model in education, teachers' teaching practice, and the advantages of applying the PDCA model in teaching practice. A total of 26 articles were found after being screened based on the criteria that have been determined. In this study, qualitative methods with PRISMA guidelines were used to analyse the content of the articles. Therefore, this study expected that more research could be multiplied in this field further in the future.

Keywords: PDCA MODEL, Teaching Model, Teachers' Teaching Practices, Teacher's Teaching Management, Advantages of PDCA Model

Introduction

The Philosophy of National Education (FPK) has outlined the role of teachers is vital in educating and building the human capital of students in schools. The evolution of the education system often brings challenges and changes to the role of teachers in handling responsibilities and maintaining professional quality as educators. Teachers must be skilled and able to become professional educators in their field (Zamri and Anita, 2020). To preserve the quality of the education system to be on par with the passage of time, teachers must be more creative, innovative and effective in teaching delivery and often provide new approaches to assimilate their practice with the needs of students as knowledge workers in the 21st-century information revolution (Hadibah, 2020).

In recent years, teachers have faced various challenges in an increasingly complex field of education. Recently, the escalating Covid-19 epidemic has affected teachers with panic and worry about the spread of the virus, discomfort in interpersonal communication, and indirect adaptation to new teaching modes (online classes). In such situations, teachers must act by following in the footsteps of rapidly evolving technology regardless of willingness so that students do not drop out of learning. According to Fernando (2021), the spread of the Covid-19 epidemic has caused most students to lose the knowledge, skills and content of lessons learned previously. In Malaysia, the command control movement (PKP) was started on 18

March 2020 and schools were closed due to the outbreak of Covid-19. To prevent students from dropping out of learning, the Ministry of Education Malaysia (MOE) has introduced a home learning and teaching program (PdPR) to be implemented for all students from pre-school to institutes of higher learning. Thus, online learning has been made the main learning for students so that they do not drop out of learning. However, such online learning created confusion at the beginning of the implementation of PdPR.

To maintain the quality of teaching and professionalism of teachers, the practice of a teacher in the implementation of responsibilities is an essential element because every action taken can affect the teaching and facilitation process (PdPc) as well as non-academic tasks. Furthermore, the professionalism of teachers in determining the well-being of students is a very complex matter where teachers need to develop an optimal, effective and productive approach by going through various trials and errors. Therefore, teachers' practice in carrying out responsibilities is better if guided by a model because they can manage responsibilities more smoothly and systematically.

There are various models related to education that have been introduced by philosophers or educators, such as the Sim teaching model, CIPP Assessment model, CIRO model, PDCA model and so on. These models are essential and should serve as a guide to educators in planning and implementing PdPc, special task management, and effective communication to encourage more effective teacher work. As such, this study will take a more in-depth look at the PDCA model in education, teacher teaching practice, and the advantages of applying the PDCA model in teacher teaching practice.

Purpose of the Study

A systematic literature review requires evidence appropriate to the specific research question. A detailed selection process was used to avoid elements of bias in the selection and identification of study articles. This systematic literature review aims to find out more in-depth about the teaching practices of school teachers based on the PDCA model. In addition, this systematic literature review can also help in synthesising past studies on teachers' teaching practices by identifying:

- Introduction to the PDCA model in education
- Teacher teaching practice
- Advantages of applying the PDCA model in teacher teaching practice

Methodology

A systematic literature review was conducted to systematically identify the complete knowledge that would govern the ongoing study (Booth et al., 2016). In this study, the PRISMA model has been used as a reference in the handling and reporting of article findings. According to Hayrol et al (2019), the PRISMA model serves as the primary guide because researchers can handle the required information in an organised or step-by-step manner and simultaneously maintain the quality of the highlights they want to produce.

Researchers have explored articles related to school teachers' teaching practices based on the online PDCA model to conduct this systematic survey study. After that, the researcher classified the articles before analysing them according to sub-headings: introduction to PDCA model in education, teacher teaching practice based on PDCA model, and advantages of applying PDCA model in teaching practice. Next, the researcher reads and understands the abstract of the article to make a choice as to whether the content is relevant and appropriate

to the purpose of the study. Finally, the researcher has selected 26 articles to be analysed using the content analysis method that is used to formulate and report written data.

Identification Process

In the PRISMA model, there are four stages of the process: identification, screening, eligibility and included. For the first stage, the identification (identification) must use keywords to find articles that are appropriate and relevant to the title of the study. There are 6 databases used: Academia, books, Google Scholar, proceedings papers, Semantic Scholar and Research gate. The database significantly facilitates researchers in collecting literature data systematically.

Table 1
Keywords in the article search process

Introduction to the PDCA model in education
PDCA model
Deming Wheel
continuous quality improvement
plan, do check, act
Teacher teaching practices
Teacher practices
Teacher teaching method
Before teaching, during teaching and after teaching
Teacher achievement
Advantages of applying the PDCA model in teacher teaching practice
Application of the PDCA model
Advantages of the PDCA model
PDCA model in education
PDCA model in teaching

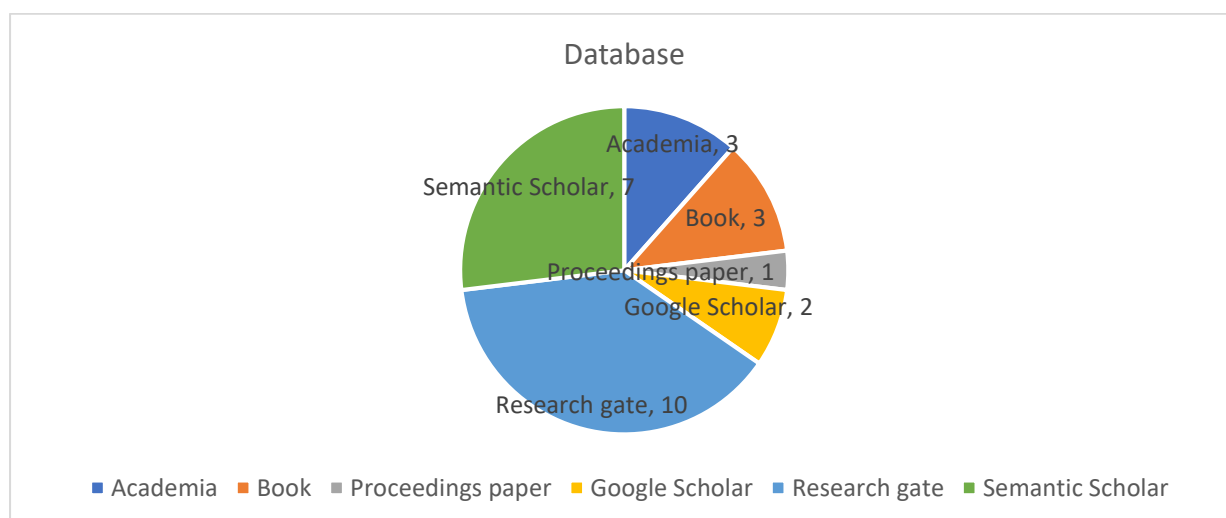


Figure 1 Database in the identification process

Screening Process and Eligibility Process

The following process is the screening process and the eligibility process. Researchers have determined several criteria in order to filter and select the articles sought to meet the quality of the study. The criteria specified are type of publication, language, period of publication, mode of access, publication network, type of study and research methodology. The table below shows the article selection criteria.

Table 2

Criteria in order to filter and select the articles

Type of criteria	Criteria	Selected	Excluded
Publication	Journal articles	✓	
	Proceedings paper	✓	
	Report	✓	
	Dissertation/ thesis	✓	
	Books	✓	
Language	Malay	✓	
	English	✓	
	Mandarin		✓
Accessibility	Paper	✓	
	Online	✓	
Period of publication	2013- 2022	✓	
Publishing area	In the country	✓	
	Overseas	✓	
Type of study research	Empirical study	✓	
	Theoretical study	✓	
Research methodology	Qualitative	✓	
	Quantitative	✓	

Thus, there are 26 articles discussing the teaching practices of school teachers based on the PDCA model. The articles have met the criteria set based on the table above.

Process Included

In the PRISMA model, the fourth stage of the systematic review process, the included process, is to include a list of articles that have been identified by meeting all the criteria in the group of articles to be analysed. With this process, 26 articles that meet the selection criteria will be analysed according to the theme that has been determined, namely the introduction of the PDCA model in education, teacher teaching practice, and the advantages of applying the PDCA model in teacher teaching practice. Overall, this study has followed the guidelines of the PRISMA model, as shown in Figure 2.

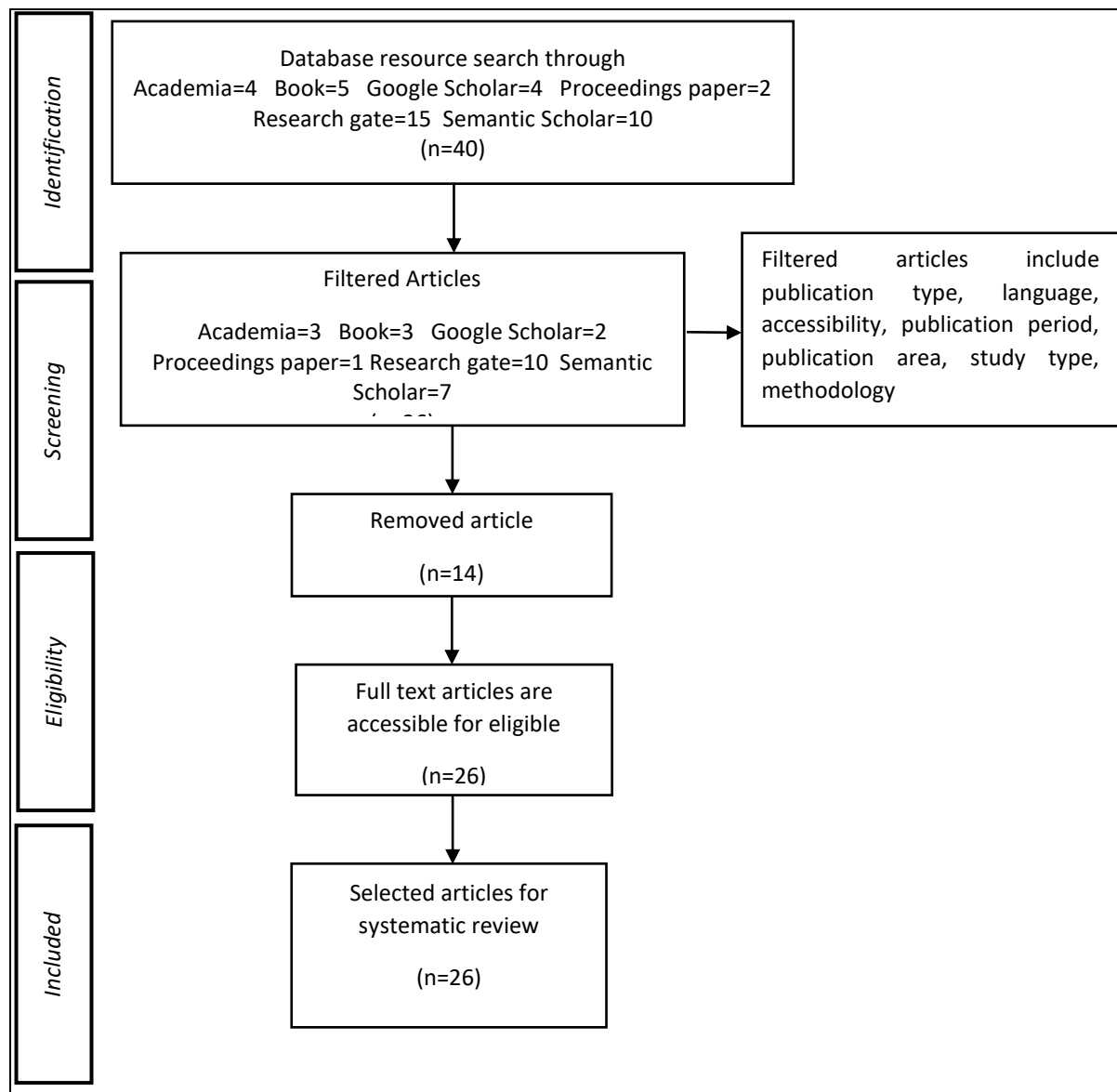


Figure 2 PRISMA model flow chart

Findings of the Study

The selection of 26 research articles was conducted based on the PRISMA model flow chart guide. The selected studies are based on the specified criteria and will answer the research questions that the researcher has constructed.

PDCA Model in Education

Over the past few decades, every industry, including the field of education, has realised that continuous improvement needs to be sustained to be competitive in the global market. Intense market competition and job demand from employers require quality and excellent human resources that can give them confidence. Therefore, the PDCA model is one of the management models that can be used as a guide to achieving this goal.

The abbreviation for PDCA consists of the English words plan, do, check and act. Each word represents stages in the PDCA model. The model is also known as the “quality loop” and is a general model of quality management used to control the improvement or maintenance

of a process as a whole in various fields of industry. Meanwhile, the model is also applied in the field of education to promote the improvement of teaching quality (William, 2000; Nicholas et al., 2016).

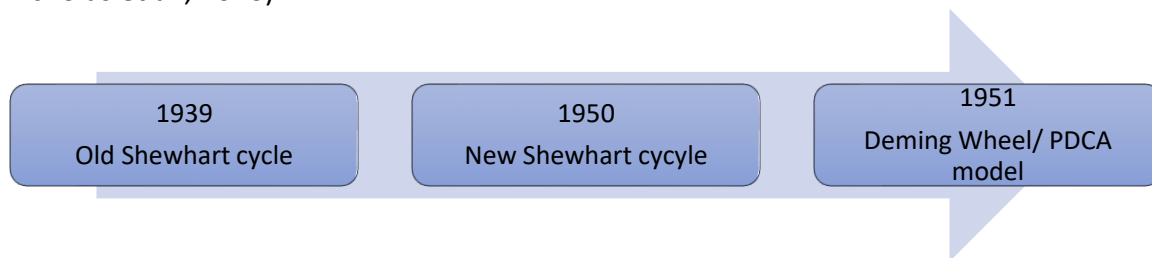


Figure 3 Evolution of the PDCA model

In 1939, the United States statistician Walter Andrew Shewhart introduced the SPI cycle, which is “specification, production, inspection”, then underwent changes in 1950 which became the PDSA cycle which is “plan, do, study, act”. Subsequently, the cycle was further developed by the US state quality management expert William Edwards Deming to the PDCA model or also known as the Deming Wheel (Sarah et al., 2020), in 1951. One of the phases in the model was developed from ‘study’ to ‘check’ because William Edward Deming found that “check” emphasises examination and is more important than analysis.

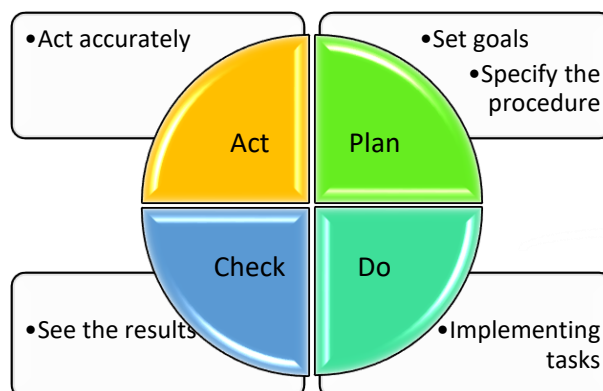


Figure 4 PDCA mode: Plan, Do, Check, Act and purposes

Figure 4 shows the stages found in the PDCA Model and their respective purposes. The PDCA model is beneficial in the implementation of systematic improvements as well as bringing about improvements towards preventing recurring errors by setting standards and continuing standardisation in a program (Zarirah et al., 2019). The PDCA model comprises four stages: planning, do, check, and act. The planning stage aims to assess the objectives or goals and determine the procedures that can ensure implementation is on track. Next, the performing stage seeks to carry out the tasks that have been predicted in the planning stage and then collect data for the review stage. In the review stage, the results of the data collected will be evaluated and compared with the goals that have been determined. At the action stage, corrective action will be taken to eliminate the anomalies found in the results in order to prevent the anomalies from happening again (William et al., 1996; Marta, 2017). The four stages have reflected the logic in the current operation of the stages.

Teacher Teaching Practices

Globalisation, liberalisation and the rapid development of information and communication technology (ICT) have created various challenges to the development of the country. This rapid and challenging development also brings transformation to the development of the education system so that it can be competitive with other countries. Educational transformation is an obligation because the success of the economic transformation is highly tied and depends on an education plan that is futuristic in nature (Abdul Ghoni, 2018). It is clear that the transformation of the education system must be done continuously and effectively in order to form a generation of quality and skilled and always ready to face various challenges at the global level. Accordingly, many aspects of the education system will also follow in the footsteps of the transformation, the most basic of which is the teaching practice of teachers.

Teachers' teaching practices will influence teachers' career performance as well as the education system. A librarian, John Cotton Dana (1912), once stated that "who dares to teach must never cease to learn". This statement clearly states that people who dare to teach must not stop learning. Teachers, as a catalyst and shapers of well-equipped human beings to meet the challenges of this era of globalisation, should have a culture of lifelong learning, communication skills, technology skills, creative and critical thinking, and national identity. Thus, teachers can perfect teaching practices systematically and effectively.

In perfecting the teaching and facilitation process (PdPc), the teaching model of Joyce and Weil (1980) has stated that the process of planning, implementing and evaluating is necessary so that the teaching and learning are meaningful, effective and complete. Teachers also play a role as facilitators in unearthing talent and developing the potential of students as a whole, which is to ensure student achievement at the optimum level consistently. Standard Guru Malaysia (MOE, 2009) has stated that the principles and characteristics of excellent teacher practice are that teachers need to have a high level of educational professionalism, knowledge and understanding, and PdPc values to support teachers to function as professionals effectively.

It is common knowledge that the Malaysia Education Development Plan 2013-2025 (PPPM 2013-2025) has been developed by the Ministry of Education Malaysia to assess the current performance of the national education system to produce a generation to meet the needs of the 21st century. To achieve this goal, teachers' teaching practices must undergo a transformation based on appropriateness and the passage of time in order to stimulate students' interest in following PdPc and completing tasks perfectly. In an effort to dig out and produce quality students, teachers are also faced with various problems and challenges that may determine the career and quality of a teacher. In the process of conducting PdPc, the acceptance of student knowledge often depends on the teacher's teaching practices that can bring about changes in terms of knowledge, thinking skills, and student performance. Therefore, the teacher's teaching practice can be said to be the action or response of the teacher to conduct PdPc to ensure that the quality of students can be maximised through his teaching practice.

Teaching practices that encourage collaboration between students, create active learning and can improve student achievement through monitoring the progress of their learning process is an effective teacher teaching practices (Raba, 2017; Berenyi & Deutsch, 2018). Zetty's study (2017) also stated that effective teaching practices of teachers could be seen through the ability of teachers to create active learning situations, that is, the extent to which practical, creative and productive activities can be done. Looking back at previous

studies from Juliana et al (2017), 21st-century teacher knowledge and skills influence a teacher's level of quality in their preparation before, during and after PdPc in the classroom. The findings of this study align with the aspects emphasised in the teaching model of Joyce and Weil (1980) that planning, implementation and evaluation are the basis of teaching and learning. Furthermore, the delivery of teacher knowledge to students with emphasis on the achievement of objectives and standards of student learning will create more effective teaching and learning (Lela et al., 2020)

Several studies related to the topic have been conducted by individuals in the country and abroad. In the study, Arlon (2018) has discussed the trainee teachers' understanding of reflective teaching practices, the types of reflective teaching practices carried out by teachers, and the barriers while practising reflective teaching. The results show that the practice of reflection should be integrated as part of the curriculum to further improve reflective skills among trainee teachers. Next, Fadilah's (2017) study has introduced the quality of teacher practice in PdPc Malay language in MRSM. In the study, four parts have been seen: teaching planning and preparation, classroom management, teaching and professionalism responsibilities. The study results stated that the practice of planning and preparation of daily teaching is done well before a PdPc begins. Teachers are committed to creating a fun and comfortable PdPc process.

Next, Carroll's (1963) model is the earliest model introduced to effective teaching practice. Five factors affect teachers' teaching: attitude, ability to adapt to teaching, craftsmanship, opportunities and quality teaching. In addition, Slavin's (1994) model was also introduced with the same purpose of effective teacher teaching practices from four perspectives: teaching quality, appropriateness of teaching level, incentives and time allocated for teaching. According to Taba (2017), teachers' teaching practices that have various teaching and pedagogical methods can determine the achievement of students' learning objectives, so the role of teachers' teaching practices is very important to lead students to a more excellent level.

Overall, teachers need to practice effective teaching to provide meaningful education to students (Berenyi et al., 2018). Moreover, with effective teacher teaching practices, students will not only be able to learn knowledge and skills, but they will also behave more positively, and this is in line with the aspirations to be achieved in PPPM 2013-2025 (Lela et al., 2020). Therefore, the role and teaching practice of teachers is important in creating a meaningful and effective PdPc as well as forming a strong student body, as has been stated in the intentions of the MOE.

Advantages of application of the PDCA model in teacher teaching practice

Good teacher practice teaching will lead to an increase in the efficiency of overall career performance. In order to have good practice in the field of work, teachers can refer to management models such as the PDCA model, ADDIE model, and ASSURE model as a guide in the planning and implementation of teaching. The application of the model in teaching practice will benefit teachers. In this systematic literature review, past studies on the advantages of applying the PDCA model in teacher teaching practice will be discussed.

The study of Ida et al (2014) examined the application of the model for accounting courses for undergraduates in universities. The results show that the PDCA model enables lecturers to focus on the satisfaction of undergraduate learning in terms of educational process levels such as design, management and evaluation, then create a continuous commitment to the improvement of the course. In addition, in the study of Natarajan et al.

(2015), the PDCA model can arouse students' interest in learning skills and help faculty or course administrators redesign and improve web content to suit students' needs. In addition, Yan Yang's (2021) study has also applied the PDCA model to the Undergraduate Innovation and Entrepreneurship Training Programs (UIETP) project to improve the quality of the project. The results show that this system effectively affects the relationship between administrators and teachers by encouraging cooperation. Finally, Dmitriy's (2021) study has also examined the practicality of the Simple Learning Motivations Hierarchy Model (SLMHM) by analysing its similarities with the PDCA models. The results showed that SLMHM could be applied in interactive processes, cases whose objectives are not clearly formulated and used in various domains.

In addition, Aswin's (2017) study results show that the PDCA model can produce systematic learning benefits for teachers in taking further action on teaching improvement. Furthermore, Ji Cai's (2015) study has also shown that PDCA and Six Thinking Hats models can improve the teaching quality of Modern Machining Technology (MMT) and Advanced Manufacturing Technology (AMT). In addition, these models can also solve teaching problems caused by a lack of classrooms and incomplete teaching materials. This has shown the importance of the PDCA model and its great practicality and value as a reference.

In addition, the study of Yige et al (2019) showed that a significant advantage of the PDCA model is that the model can further improve the results of each evaluation as well as promote the development of the entire system and drive continuous progress of the whole system. Other than that, the study of Tomoko et al (2016) showed that applying the PDCA model to leadership education has resulted in continuously improved quality. In this model, students acquire knowledge, perform simulations, apply simulation experiences to real situations and make reflections on their actual actions. Furthermore, the study of Sérgio Luís et al (2014) showed that the PDCA model is not only about collaborative planning, teaching and improvement, but even the PDCA model can develop opportunities for continuous and creative improvement in overall teaching.

According to the study by Pratik et al (2017), the PDCA model provides a simple and effective approach to problem-solving, managing change, and ensuring ideas are tested before fully implementing them. In addition, the study of Kartikowati (2013) also revealed the issue of how the concept of PDCA contributes to the efforts of providing professional teaching staff through micro-teaching in the faculty of management training and education at the University of Riau Indonesia. The study's findings indicate that the concept of PDCA can provide guidelines as a teaching practice to implement more targeted and measurable micro-teaching courses. The implementation of three stages in teaching, namely induction set, teaching and closing, can also be provided with different teaching skills when referring to the PDCA model. The model can also assist trainee teachers and novice teachers in perfecting their teaching practices through cooperative learning and reflection sessions in micro-teaching courses.

The PDCA model can be applied to all processes and quality management systems as a whole (Department of Standards Malaysia, 2015n). This application is possible because the model can support the organisation, ensuring the process is well managed with complete opportunities and resources. Furthermore, with this model, it is also possible to determine and implement the improvement process so that a project can avoid anomalies and be seen as perfect. Next, Shuyang's (2021) study has also introduced the integration of the PDCA model in blended learning for psychology courses in colleges. The result of the study is that

lecturers are more conducive to understanding the situation of students over time and can improve the quality of teaching.

Conclusion

Due to the development of education at this time, the role of teachers in teaching is increasingly challenging. The key findings of our study pointed out that the PDCA model influenced teachers' teaching practices. Therefore, teaching practices guided by the PDCA model are very beneficial in determining the success of implementing transformation in the education system. Next, this study contributes new knowledge on the influence of the PDCA model on teachers' teaching practices. All in all, the present study could create value by providing helpful information to teachers and novice teachers about their roles and practices that should be practised to strengthen professionalism as teachers.

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