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Navigating Practicum Challenges: A Study of Science Pre-Service Teachers' Experiences

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Abstract:

The primary objective of this study is to investigate the challenges faced by science pre-service teachers during their practicum sessions. The research goals encompass the identification of personal, supervision-related, and school-related difficulties encountered by these pre-service teachers, as well as an exploration of the strategies they employed to address these challenges. A total of 54 science pre-service teachers, all in their seventh semester, actively participated in this study. Descriptive analysis was employed to assess the mean ratings assigned to the challenges encountered and the strategies employed to overcome these obstacles. The study's findings revealed that science pre-service teachers encountered personal-related issues primarily related to the acquisition of Teaching and Learning Materials (TLMs) and their confidence levels in delivering lessons. Furthermore, challenges in the realm of supervision emerged, particularly concerning the provision of feedback, mentor relationships, and assessment practices. School-related issues included disruptive student behaviour, establishing authority within the classroom, and the accessibility of instructional materials. Nevertheless, the pre-service teachers demonstrated a diverse range of strategies to effectively address these challenges. These strategies encompassed seeking guidance from mentors, engaging in self-reflection, and leveraging educational resources. This research provides valuable insights into the challenges confronted by science pre-service teachers during their practicum experiences, offering recommendations for enhancing teacher training programs in response to these challenges.

Keywords: Science pre-service teachers, Practicum sessions, Challenges

1. Introduction

Becoming a teacher is a challenging and demanding profession that requires years of dedicated study and substantial practice. This challenge becomes even more daunting when it pertains to teaching the complex subject of science. Effective teaching hinges on practical experience, making it an indispensable component of teacher preparation.

Every teacher education program worldwide comprises two essential phases: theoretical learning and its real-world application. Prospective teachers must complete their practicum, also known as teaching practice, typically undertaken during the final year of their teacher education program, before they can be certified to work as educators (Huu Nghia & Tai, 2019). Thus, the teacher education program's practicum is a cornerstone of teacher preparation.

During their practicum, preservice teachers transition from learners to educators. They refine their skills under the guidance of university supervisors and mentor teachers, a crucial aspect facilitated by teacher education programs. The practicum offers preservice teachers an unrestricted opportunity to assume the role of a teacher and experiment with the knowledge they've acquired. This experience is pivotal in helping them integrate coursework theories with real-world practice, thereby shaping their identities as future educators. Recognizing the significance of this experiential phase in preparing future teachers, it is imperative to address the potential barriers that can hinder its effectiveness.

Problem statement:

Science pre-service teachers hold a pivotal role in shaping the future of education. As an integral part of their teacher education program, they engage in a practicum session that offers hands-on teaching experience in real classrooms. However, despite the stringent selection process involving the Malaysian Educators Selection Inventory (MEdSI), university admission interviews, and completion of core and pedagogical coursework, some science pre-service teachers still grapple with significant challenges during their practicum. These challenges impede their professional growth and can impact their overall effectiveness as future educators.

The issue at hand is that even after meeting prerequisites, such as successful completion of the MEdSI, interview assessments, and university coursework in core and pedagogical subjects, science pre-service teachers within the Faculty of Education continue to face hurdles during their practicum experiences. The teaching practicum is structured to enable pre-service teachers to put into practice the theoretical knowledge they have acquired within an authentic school environment. This underscores a gap in our understanding of the factors contributing to these recurring issues, their influence on pre-service teachers, and the strategies they employ to overcome them. These challenges encompass personal, supervision-related, and school-related obstacles, all of which hinder the professional development of pre-service teachers and potentially compromise their effectiveness in the classroom.

Recent research highlights an array of personal challenges encountered by science pre-service teachers during their practicum, including self-doubt, lack of confidence, time management difficulties, and concerns about their subject matter knowledge. The transition from student to teacher poses challenges for pre-service teachers in setting their own goals to become professional educators (Mustajab et al., 2023). It was discovered that not all pre-service teachers are capable of effectively applying theoretical knowledge in the classroom learning process. Many expressed concerns that hindered their motivation, actions, and prospects for the future (Nurzen et al., 2022).

Supervision-related issues, such as limited feedback, inconsistent guidance, and unclear expectations from supervisors, have also been reported and effective feedback is timely (McKibben et al., 2019). Timely feedback helps pre-service teachers understand what they did well and what they need to improve upon while the experience is still fresh in their minds. Additionally, school-related obstacles, such as classroom management issues, adaptation to school culture, and coping with limited resources, have been identified as hurdles for science pre-service teachers (Maulida et al al., 2023). These findings substantiate the existence of multifaceted challenges during the practicum period.

In response to these challenges, this research study aims to investigate and identify specific personal, supervision-related, and school-related issues faced by science pre-service teachers during their practicum. Furthermore, it will delve into the strategies employed by these pre-service teachers to overcome these challenges. By comprehensively understanding these obstacles and the strategies employed to tackle them, this research seeks to bridge the knowledge gap and offer insights and recommendations for teacher education programs, schools, and policymakers. The ultimate goal is to better support science pre-

service teachers during their practicum experiences, enhance their professional development, and ultimately contribute to the improvement of science education.

1.1. Research Objectives

The research objectives encompass:

I. To discern the personal challenges that science pre-service teachers encounter during their practicum.
II. To explore the supervision-related difficulties faced by science pre-service teachers during their practicum.
III. To scrutinize the school-related obstacles experienced by science pre-service teachers during their practicum.
IV. To investigate the strategies employed by science pre-service teachers to navigate and overcome the challenges.

2. Literature Review:

The practicum experience within teacher education programs holds immense significance, bridging the gap between theoretical learning and the practical demands of real-world teaching. This immersive engagement provides aspiring educators with a vital opportunity to apply their academic knowledge, refining their teaching skills through hands-on experience (KARSLİ & YAĞIZ, 2022). Throughout the practicum, pre-service teachers work closely with experienced mentors or supervisors, who offer invaluable guidance and constructive feedback, fostering their professional growth (Mohd et al., 2021). This phase serves as a foundational pillar in the development of pedagogical philosophies, instructional strategies, and the overall effectiveness of future educators (Qing, 2021). Consequently, the enhancement of teacher preparation programs and the subsequent success of educators greatly rely on recognizing and addressing the challenges encountered by science pre-service teachers during this pivotal period.

Personal-related Problems Encountered by Science Pre-Service Teachers During Practicum

During their practicum, science pre-service teachers often confront personal challenges that significantly influence their teaching capabilities and overall readiness. One pivotal aspect of teacher development is self-efficacy, which shapes how pre-service teachers approach their roles. Poulou's research (2019) underscores the significance of self-efficacy beliefs, indicating a strong correlation between higher levels of self-efficacy and the use of effective teaching strategies and positive classroom interactions. Conversely, those struggling with self-efficacy may experience self-doubt and insecurity regarding their ability to lead engaging classes and manage classroom dynamics.

Furthermore, the practicum experience can induce stress and anxiety in science pre-service teachers. Maulimora's study (2019) reveals that pre-service teachers often grapple with apprehension and tension when transitioning to actual classroom settings. They may feel pressure to excel or worry about effectively managing a diverse group of students, contributing to heightened stress levels. Such stress can adversely impact self-assurance and adaptability, thus constraining the ability to create a positive learning environment.

Insufficient pedagogical skills, including challenges in lesson planning and classroom management, can exacerbate difficulties during the practicum and undermine teaching effectiveness. Strong pedagogical abilities are crucial for engaging students effectively and delivering relevant lessons. The teaching practicum provides pre-service teachers with the opportunity to enhance their teaching skills (Minarti et al., 2023). For science pre-service teachers, tasks like designing engaging activities, maintaining classroom order, and adapting teaching methods to cater to diverse learning needs can pose significant challenges. However, these hurdles can be overcome through educational training and practical experience.

Teacher preparation programs must provide specialized support and resources to help science pre-service teachers address these psychological challenges. Implementing self-efficacy-building practices, such as mentorship programs or reflective exercises, can boost pre-service teachers'

confidence and their perception of their teaching abilities. Additionally, organizing workshops and training sessions focused on subject matter expertise and pedagogical skill enhancement can improve their preparedness and teaching efficacy (Darling-Hammond et al., 2019).

Supervision-Related Problems Encountered by Science Pre-Service Teachers During Practicum

Supervision stands as a cornerstone in enhancing the performance of pre-service teachers, constituting a fundamental element in teacher preparation that nurtures improvements in teaching and learning dynamics. Throughout the practicum, the attitudes of supervisors toward pre-service teachers wield considerable influence over their skills, competence, and overall achievement of practicum objectives. Effective supervision is indispensable, as the entire process loses its purpose without it. Regular supervision of pre-service teachers' teaching practices isn't just advisable but essential. Many pre-service teachers conveyed concerns that dampened their motivation, actions, and outlook for the future (Nurzen et al., 2022). Supervisors must possess the necessary qualifications and experience to offer the guidance and support student teachers require.

The supervisory process encompasses critical components such as feedback, guidance, and support. Through consistent, constructive feedback from mentors and supervisors, pre-service teachers gain insights into their teaching strengths and areas needing development. This constructive criticism empowers pre-service teachers to engage in reflective practice, aiding them in identifying adjustments to their teaching techniques and methods (Machost & Stains, 2023). Timely and targeted feedback plays a pivotal role in cultivating self-efficacy and instilling confidence in one's teaching abilities.

School-Related Problems Encountered by Science Pre-Service Teachers During Practicum

Issues related to adaptability and school culture can significantly impact the experiences of science pre-service teachers during their practicum. School culture encompasses a spectrum of values, beliefs, and traditions that may vary across educational institutions. An environment lacking support can negatively impact pre-service teachers' emotions, leading to feelings of anxiety, concern, and stress (Maulida et al., 2023). When science pre-service teachers are placed in a school with a culture different from what they are accustomed to, they may encounter challenges in adapting and assimilating. Consequently, some students may experience a sense of detachment or find it challenging to comprehend and adhere to the school's rules and procedures.

Furthermore, certain school standards and procedures may not align with the pedagogical methods covered in their teacher preparation courses. These disparities can lead to conflicts and confusion in the teaching strategies of science pre-service teachers as they grapple with these differences. For example, science pre-service teachers trained in more student-centered and inquiry-based methods might encounter difficulties in adjusting their instructional approaches to align with the school's predominant traditional lecture-based teaching approach (Almulla, 2020**).**

3. Research Methods

4. Results

Table 1 Demographic data of the Respondents

	Frequency	Percentage
Gender		
Male	**9**	**16.7**
Female	**45**	**83.3**
	54	**100**
Program		
Biology	**28**	**51.9**
Physics	**9**	**16.7**
Chemistry	**17**	**31.5**
	54	**100**

Table 1 illustrates the demographic composition of respondents, categorized by gender. Among the total 54 participants, 45 (83.33%) were identified as female, while 9 (16.67%) were male, indicating a notable predominance of female respondents. This gender distribution mirrors the diverse

enrollment rates observed in science education disciplines, namely Biology, Chemistry, and Physics, elucidating the variance in male and female representation within the sample. Furthermore, the table delineates the distribution of respondents according to their respective academic programs. Notably, 28 participants (51.9%) were affiliated with the Biology Education program, 17 (31.5%) with Chemistry Education, and the remaining 16.7% were pursuing studies in Physics Education.

Personal-related Problems Encountered by Science Pre-Service Teachers During Practicum

The primary research objective initially aimed to identify personal-related challenges faced by science pre-service teachers during their practicum. The study's findings revealed that these teachers reported a relatively lower frequency of personal-related issues during their practicum sessions. This discovery implies that the pre-service teachers had received sufficient preparation and support to effectively manage personal challenges within the practicum environment.

To ensure the readiness of pre-service teachers before their practicum experiences, the Faculty of Education has implemented various measures. For instance, pre-service teachers are mandated to attend seminars or workshops offering guidance and support on practicum expectations and potential challenges. These sessions serve as platforms for engaging in discussions about personal aspects such as self-efficacy, stress management, and coping strategies, which likely contribute to the reduced incidence of personal problems reported by the pre-service teachers.

Additionally, the inclusion of a microteaching subject in the pre-service teachers' curriculum enhances their preparedness by equipping them with essential teaching skills, pedagogical strategies, and effective lesson planning and delivery techniques. This pedagogical training empowers them to engage students effectively and manage classroom dynamics, thus minimizing personal challenges arising from a lack of pedagogical understanding or classroom management. Throughout their practicum experiences, this training assists participants in building confidence and competencies necessary to address personal challenges.

Moreover, pre-service teachers are required to take core subjects specific to their science programs, covering critical content knowledge and teaching methodologies. This ensures that pre-service teachers possess a solid foundation to draw upon during their practicum, reducing personal problems related to subject knowledge and instructional delivery.

Another notable practice within the Faculty of Education is the requirement for pre-service teachers to maintain daily journals documenting their experiences at the school. This practice promotes self-reflection and provides a platform for identifying and addressing any personal challenges encountered. Consistent journaling enables pre-service teachers to gain a deeper understanding of their strengths and areas for improvement, facilitating personal development throughout the practicum.

Supervision-Related Problems Encountered by Science Pre-Service Teachers During Practicum

The second research objective focuses on examining supervision-related challenges encountered by science pre-service teachers within the Faculty of Education during their practicum. Analysis of the study's findings revealed that the mean score for supervision-related issues was relatively low, suggesting that science pre-service teachers faced only minor challenges in this aspect.

The Faculty of Education demonstrates a strong commitment to providing high-quality supervision to pre-service teachers during their practicum experiences. This commitment likely includes establishing clear expectations for supervisors and mentors regarding their roles in supporting and guiding pre-service teachers. Faculty members understand the pivotal role of supervision in the professional development of pre-service teachers and prioritize ensuring that supervisors and mentors are adequately prepared to offer relevant feedback and assistance.

Recognizing the crucial role played by supervisors in shaping the future of teaching, the Faculty of Education may invest in ongoing professional development opportunities for these individuals. Workshops, training sessions, and seminars can aid supervisors and mentors in enhancing their skills in providing effective feedback, managing communication with pre-service teachers, and fostering a supportive learning environment. Improved supervisory practices have the potential to result in more positive and meaningful practicum experiences for science pre-service teachers.

Moreover, it is vital for the Faculty of Education to actively facilitate open lines of communication between pre-service teachers and their supervisors. Regular meetings, check-ins, and reflective discussions create opportunities for pre-service teachers to express their concerns, seek clarification on feedback, and address any issues encountered during their practicum. Open and constructive communication establishes a supportive relationship between supervisors/mentors and pre-service teachers, thereby enhancing the effectiveness of the supervisory process.

School-Related Problems Encountered by Science Pre-Service Teachers During Practicum

The third research objective delves into school-related challenges experienced by science pre-service teachers within the Faculty of Education during their practicum. The findings indicate that science pre-service teachers encountered relatively minor difficulties during their practicum experiences. The neutral or indecisive mean score for school-related issues suggests that science pre-service teachers did not report significant problems or challenges related to the schools where they were placed during their practicum.

Several factors may contribute to the school-related challenges mentioned by science pre-service teachers. Firstly, the practicum location may introduce a different school culture and climate than what pre-service teachers are accustomed to, necessitating adjustments and potentially leading to obstacles in classroom management. Additionally, disruptive student behavior and the perception of pre-service teachers as transient may arise due to the novelty of the practicum arrangement, wherein students may not fully recognize the authority of these pre-service teachers.

Unsupportive and uncooperative school staff may stem from differing teaching philosophies or conflicting expectations between pre-service teachers and school personnel. Moreover, a shortage of teaching resources in practicum schools could result from resource constraints or inadequate planning, limiting pre-service teachers' ability to conduct engaging lessons. Similarly, demanding school responsibilities assigned to pre-service teachers may result from their placement in busy or high-demand schools, affecting their preparation time for lesson plans.

Addressing these school-related challenges is crucial to enhancing the practicum experience for science pre-service teachers. Strategies such as providing classroom management training, establishing clear disciplinary policies, and improving resource allocation within schools can help mitigate these issues. Collaborative efforts between universities and practicum schools to create a welcoming learning environment and supportive school staff can contribute to a more positive practicum experience.

Furthermore, organizational and administrative factors within the school may also influence the school-related challenges faced by science pre-service teachers during their practicum. School cultures and norms play a pivotal role in shaping teachers' experiences and relationships within the school community. If the school culture does not support or acknowledge pre-service teachers, they may feel isolated and disengaged, impacting their overall practicum experience. Conversely, schools that foster a positive and collaborative environment can provide pre-service teachers with a sense of belonging and support, thereby boosting their confidence and teaching efficacy.

Moreover, the availability of resources and staff support within practicum schools significantly influences the quality of the teaching and learning experiences of science pre-service teachers. Schools lacking adequate teaching materials, equipment, and technological resources may hinder pre-service teachers' ability to conduct engaging and interactive lessons, limiting their pedagogical practices. Additionally, the level of support and guidance provided by school personnel, particularly experienced teachers and mentors, can influence pre-service teachers' confidence and their ability to address classroom issues effectively.

Overall, the practicum environment and school-related challenges can significantly impact pre-service teachers. For instance, encountering disruptive students or lacking proper teaching equipment may diminish their confidence and self-efficacy, making it challenging to maintain student engagement and manage the classroom effectively. Furthermore, encountering unsupportive school staff or unclear disciplinary procedures may add stress to the practicum experience, reshaping how pre-service teachers perceive their role and efficacy within the classroom.

5. Conclusion:

This study delved into the challenges encountered by science pre-service teachers during their practicum, aiming to identify personal, supervision-related, and school-related issues, along with exploring the strategies employed to address these challenges. The findings of the study illuminate the spectrum of difficulties experienced by science pre-service teachers throughout their practicum. Personal hurdles, such as struggles in locating teaching resources, confidence issues in lesson delivery, and maintaining student engagement, were observed at moderate levels. Nonetheless, it was noted that pre-service teachers reported fewer personal concerns as they progressed through their practicum, suggesting the acquisition of coping mechanisms to effectively tackle these challenges.

Supervision-related challenges emerged, including the desire for more comprehensive feedback, disparities in expectations with mentors, and unease in the presence of supervisors. Despite these issues, fewer supervision-related concerns were reported over the duration of the practicum, indicating generally adequate support and guidance from mentors and supervisors. Moreover, moderate levels of school-related challenges were identified, such as managing disruptive behaviour, a lack of clear disciplinary protocols, and limited teaching resources. However, post-practicum assessments revealed average levels of school-related difficulties, indicating an ability to navigate the school environment to some extent. Despite these obstacles, science pre-service teachers exhibited resourcefulness and resilience, employing various strategies such as seeking assistance from peers and mentors, engaging in self-reflection, utilizing available resources, and adjusting teaching methodologies. The high satisfaction levels associated with these strategies underscore their efficacy in assisting pre-service teachers in overcoming the hurdles encountered during their practicum.

The study's findings carry several implications for the Faculty of Education and other teacher education institutions. Enhancing support and mentorship for pre-service teachers during their practicum could prove instrumental in addressing the identified challenges. Moreover, fostering opportunities for collaboration and experience-sharing among pre-service teachers can contribute to establishing a supportive learning milieu. Furthermore, it is imperative to acknowledge the limitations of the study, such as its small sample size and limited timeframe. Future research endeavors could explore the experiences of science pre-service teachers across larger samples and diverse institutional settings to attain a more comprehensive understanding.

In conclusion, this study offers valuable insights into the obstacles faced by science pre-service teachers during their practicum and the strategies employed to overcome them. By recognizing these challenges and nurturing appropriate support mechanisms, teacher education programs can better equip pre-service teachers for

a successful and fulfilling teaching career. Finally, this study serves as a catalyst for further research and enhancements in teacher education programs to ensure the continued growth and success of future educators.

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