Theory-Practice Divide: Pre-service Teachers' Application of Pedagogical Knowledge During Teaching Practicum

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ABSTRACT

Good teacher education programmes ensure good resonance between the pedagogical knowledge learned at the university and the teaching practical. However, the literature shows a significant gap between these two elements. This theory-practice divide can dishearten and potentially jeopardise pre-service teachers' ability to remain in the field. This study investigated pre-service teachers' experiences applying pedagogical knowledge learned at the university to their teaching practicum. The research aims to answer two research questions: (i) what pedagogical knowledge learned at the university was useful or inadequate during teaching practicum, and (ii) what suggestions do they have to reduce the theory-practice divide? An exploratory qualitative research design was employed. The sample consisted of seven pre-service teachers who had recently completed their teaching practicum. The main data sources were an open-ended questionnaire and online interview sessions. Data analysis used a constant comparative method to look for emerging themes. Two themes emerged regarding the first research question: (i) Useful Pedagogical Knowledge and (ii) Inadequate Pedagogical Knowledge. For the former, three categories identified were (i) general teaching methods, (ii) research-based teaching findings, and (iii) sharing of teaching experiences and modelling by lecturers. In the latter, four categories coded were (i) classroom management, (ii) online classes, (iii) completing official forms and (iv) comprehensive lesson plan. Accordingly, the pre-service teachers provided three suggestions to improve these adequacies. The study's implications indicate meta-conversations among stakeholders for more holistic programmes and as starting grounds for curriculum reviews.

Keywords: Pre-service teachers, pedagogical knowledge, teaching practicum, theory-practice divide

INTRODUCTION

Teacher education curricula are designed to develop pre-service teachers' competencies to ease their transition as teachers. The teacher education curriculum generally consists of educational theory (pedagogical knowledge) and pedagogical practices (teaching practical). Teaching practical grants for pre-service teachers to connect what they have learned in their university courses (pedagogical knowledge) to real-life experiences in schools (O'Dea & Peralta, 2011). In ideal situations, educational theory should support and complement pedagogical practices. Over twenty years ago, Lampert and Ball (1998) expressed that educational theory and pedagogical practices in teacher education are "divided both physically and conceptually", and this divide, as Honan (2007) labels the binary of theory-practice, still exists (Yin, 2019).

The theory-practice divide fractures the seamless transition of theory to practice as pre-service teachers often cannot transfer and apply their pedagogical knowledge to gain the deemed real-life experiences in schools. This divide can dishearten and affect pre-service teachers' ability to sustain themselves in this profession (Buchanan & Olsen, 2018). Research findings have established that pre-service teachers' difficulties during teaching practicum include classroom management (Komolafe et al., 2020), assessing students' work (Simon et al., 2010), managing time, implementing innovative pedagogies (Takaoglu, 2017), and coping with the overall teaching workload (Mutlu, 2015).

Unless these difficulties are addressed, the quality of teacher education programmes may continue to deteriorate. One of the ways to address these difficulties is to listen to pre-service teachers about their teaching practicum experiences, especially about what they could and could not reconcile between the academic knowledge and the realities of teaching practicum (Allen & Wright, 2014). Ulvik and Smith (2011) expressed the value of listening to pre-service teachers' experiences.

The information obtained from accurate testimonials from pre-service teachers about their experiences during teaching practicum, particularly how university courses influenced their teaching practicum outcomes, can provide teacher educators with directions on what must and should be done to better prepare new graduates for the teaching workforce (Goh & Canrinus, 2019; Toe et al., 2020). In doing so, attempts are made to reduce this theory-practice divide for future cohorts (Yin, 2019). Therefore, this study addresses this theory-practice divide by asking pre-service teachers who had just completed their teaching practical two questions: (i) what pedagogical knowledge learned at the university was useful or inadequate during teaching practicum, and (ii) what suggestions do they have to reduce the theory-practice divide?

Literature Review

The teaching practical "typically constitutes the longest and most intensive exposure to the teaching profession experienced by prospective teachers" (Cohen et al., 2013,

p. 345). In an ideal scenario, pedagogical knowledge (university courses) is designed to scaffold pre-service teachers as they navigate during their teaching practicum situated in real classrooms. There should be a constant and flexible flow of feedback from theory to practice and vice versa. The convergence of pedagogical knowledge and practices provides optimal experiences to propel pre-service teachers' confidence in the profession.

However, this is not the case. This theory-practice divide is widened by the individuals (pre-service teachers, mentor teachers and university supervisors) in the tripartite partnership during teaching practicum (Buchanan, 2020; Lynch & Smith, 2012). Firstly, when these pre-service teachers go for their teaching practicum, they are expected to develop a teaching philosophy by transferring pedagogical knowledge to authentic teaching contexts with real students and conditions (Cochran-Smith & Lytle, 1999). Since these pre-service teachers have no exposure to the know-how about teaching, many of them enter the teaching practicum with an amalgam of their prior experiences and observations of their teachers, partly cultivated by their on-campus preparation and certain assumptions about the teaching environment where the teaching practicum takes place. However, this little concoction of experience and knowledge may not tally with the reality on the ground because these prior expectations underestimate the complexity of the teaching task (Atay, 2008). Many aspects of teaching – like which content is

difficult to teach or common misconceptions for a given topic need to be exposed to these pre-service teachers. Even if it is done during university courses, pre-service teachers have found it difficult to identify these findings from research to apply to their lessons (Abas, 2016). Thus, the divide between theory and practice often results in pre-service teachers' optimism dwindling when confronted with the realities and complexities in the classroom (Bainbridge, 2011; Haritos, 2004).

Secondly, guidance from mentor teachers is often insufficient because they lack the expertise to guide pre-service teachers on balancing what they have learned at the university and modifying these practices to be doable and sustainable in the classrooms (Li et al., 2021). Moreover, they are often too busy with their schedules. They may not have the time to address all pre-service teachers' concerns about the teaching and learning processes (Jaspers et al., 2014). Thus, the theory-practice divide becomes apparent when pre-service teachers try to put what they have learned in their university courses into their daily lessons during teaching practicum.

Thirdly, the theory-practice divide enlarges when university supervisors cannot meet pre-service teachers regularly during the teaching practical due to university commitments (Beck & Kosnik, 2002). Often, pre-service teachers feel they cannot depend on their university supervisors because they lack practical experience and do not fully understand their needs in school. This lack of confidence in university

supervisors prevents pre-service teachers from engaging in essential discussions about marrying theoretical knowledge with pedagogical practices (Olsen & Buchanan, 2017).

Holton et al. (1997) proposed the climate transfer framework that describes the factors that can widen or narrow the theory-practice divide. Transfer climate refers to the work environment that can affect the transfer of learning to the job (Holton et al., 1997). According to Holton et al. (1997), seven constructs represent the transfer climate, which are supervisor support, opportunity to use, peer support, supervisor sanctions, personal outcomes (positive), personal outcomes (negative) and resistance. Previous research indicated that transfer climate could significantly affect an individual's ability and motivation to transfer learning to the job (Holton et al., 1997; Tracey et al., 1995; Xiao, 1996).

In the educational context, the transfer climate framework could indicate whether the teachers/pre-service teachers can transfer the learning they gained from the university course to the job in schools (Andreasen et al., 2019; Khan & Nazir, 2017; Snoek & Volman, 2014). For example, each interaction with the school environment or another individual would have infinite outcomes. Assuming a pre-service teacher had a 'helicopter' mentor teacher that hovered over the pre-service teacher but constructively, all is well. In contrast, if the 'helicopter' mentor teacher insists on doing certain practices her way, this pre-service teacher may have to make difficult choices. Holtan et al. (1997) described this as a supervisor's support or sanction. The former describes reinforcement and supports the use of learning on the job. In contrast, the latter describes negative feedback, active opposition, and no feedback. Therefore, transferring pre-service teachers' pedagogical knowledge gained in university courses to the teaching practicum depends on these factors.

Regarding personal outcomes, the pre-service teacher could follow what the mentor teacher requires or may stand up and choose a 'middle-ground' practice after negotiating with the mentor teacher. Personal outcomes may refer to pre-service teachers' self-efficacy and confidence gained from the pedagogical knowledge learned at university courses and the confidence to transfer that knowledge to the real-world context (Petre et al., 2022). These personal outcomes can be either positive or negative. For example, the pre-service teacher's decision would depend on his/her self-efficacy and confidence to communicate the decision to the mentor teacher. Suppose the pre-service teacher is confident about his/her theoretical knowledge and ability to translate that knowledge into practice; most likely, the pre-service teacher will negotiate with the mentor teacher, supporting their practices with theories, research findings, and artefacts to show how the assumed lesson would proceed and to gain approval of their mentor teacher.

As illustrated above, many options are available to pre-service teachers, and they are not equal and often lead to different

consequences. The theory-practice divide is legitimate and could diminish the quality of the teacher education programme. Therefore, it is pivotal for teacher educators to tap into the diversified experiences, practical knowledge, and interactions that pre-service teachers gain during their practicum (Kakazu & Kobayashi, 2022). When pre-service teachers undergo teaching practicals, their notion about what works and what does not work becomes clear because of their interactions with university supervisors, mentor teachers, peers, students, and others in the school environment (Yuan & Lee, 2014). These interactions, through meetings, classroom teachings, and discussions, influence pre-service teachers' outlook on teaching practicum. The pre-service teachers go into teaching practicals with only prior experiences and untested theories but come out of the teaching practicum with an improved notion about teaching and learning. This improved notion about teaching and learning is rich and valid information about what works and what does not, and in this lies the information on how to reduce the theory-practice divide.

METHODS

Research Design

This study adopted a basic qualitative research design to understand pre-service teachers' experiences applying their pedagogical knowledge learned at the university to their teaching practicum. Qualitative researchers are interested in understanding how people interpret their experiences, construct their worlds and what meaning they attribute to their experiences (Merriam & Tisdell, 2015). Qualitative research explores 'how' things happen in their natural setting (Creswell & Poth, 2018).

Context

The postgraduate diploma of education programme is designed for graduates with non-education tertiary qualifications keen to become educators. For this study, a public university in Malaysia offered a postgraduate diploma in education programme with 13 specialisations. Students gained admission into the postgraduate diploma of education programme based on their bachelor's degree (specialisation) and after an interview. The diploma of education programme is divided into three semesters, and in the final semester, students do their nine-week teaching practical.

Participants

A purposive sampling technique was used in choosing the research participants to gain rich data on the phenomenon. Purposive sampling assumes that the researcher wants to discover, understand and gain insight into the phenomenon (Merriam & Tisdell, 2015). Since the authors were chemistry education educators, the inclusion criteria for the participants were that they enrolled in chemistry education specialisation and completed their teaching practicum. The rationale for these criteria was to gain specific insights into the chemistry content and pedagogical methods practised at the university and how these aspects affected the

pre-service chemistry teachers' pedagogical knowledge. This study focused on how pre-service teachers perceived their pedagogical knowledge as useful or inadequate during their teaching practicum. Furthermore, the research intended to collect baseline data for curriculum review purposes in the future.

Thus, all the sixteen pre-service chemistry teachers who had just completed their nine-week teaching practicals were invited to participate in this study. In line with research ethics, the participants were informed about the purpose of the research and its voluntary basis. It was made clear that the questionnaire was not part of the examination, and their responses would have no effect on the results of the teaching practicum. They were also reassured that all data would be handled confidentially. Only seven pre-service teachers responded and were willing to be interviewed. Informed consent was obtained from these participants. In the context of this study, the participants were identified as S1 until S7.

Data Collection

An open-ended questionnaire and online interview sessions were the main data sources. The open-ended questionnaire contained eight questions about pre-service teachers' experiences during their teaching practicum, primarily if the pedagogical knowledge (or university courses) they had learned at the university were (not) useful during their teaching practicum. For example, the question, "What university courses do you think helped you with your teaching practicum? Why do you say so?"

Two experts reviewed the questionnaire to ensure content validity. The questionnaire was then administered through WhatsApp. The pre-service teachers were asked to answer the questions and email their responses. The interview sessions were held via telephone to clarify any ambiguous responses in the questionnaire. These conversations were audiotaped. The administration of the questionnaire through WhatsApp and telephone interviews was to avoid close contact with the participants due to the COVID-19 pandemic.

Data Analysis

Data analysis was organised using Miles and Huberman's (1994) three-step technique. The interview data were transcribed verbatim. Together with the responses from the questionnaires, the data analysis process began. The transcripts were carefully read with several iterations. The researchers took a descriptive position by being open to codes and recurring patterns in the data by refraining from identifying important categories prematurely but allowing the categories to emerge (Patton, 2002). As suggested by Corbin and Strauss (1990), the open coding strategy involved multiple readings of data from the interview transcripts and participants' answers to the open-ended questionnaire. The codes were organised into categories through a constant comparative method. A matrix was built, and relevant categories were placed under the appropriate themes. This process involved constant reading, re-reading, highlighting, coding, and interpretation of the data.

Two themes emerged for the first research question. There were Useful Pedagogical Knowledge (University Course) and Inadequate Pedagogical Knowledge (University Course). For the former, three categories were identified and for the latter, four categories. Correspondingly, there were three themes for the second research question.

Member checking and peer review procedures were employed to ensure the data's validity in this study. The transcribed data and a summary of the interview findings were shared with the participants, seeking feedback to confirm that the data accurately reflects their perspectives. The interview data and analysis were also deliberated with other researchers. This step encompassed a peer review process to validate the interpretations and conclusions.

RESULTS

The results are organised based on the research questions. For the first research question, "What pedagogical knowledge learned at the university was useful or inadequate during teaching practicum," there were two themes: (i) Useful Pedagogical Knowledge (University Courses), and (ii) Inadequate Pedagogical Knowledge (University Courses). For the second research question, "What suggestions do they (pre-service teachers) have to reduce the theory-practice divide," the emerging themes corresponded with the categories of Inadequate Pedagogical Knowledge (University Courses). These will be discussed in the following sections.

Useful Pedagogical Knowledge (University Courses)

The pre-service teachers highlighted three categories of pedagogical knowledge (university courses) that they found useful during their teaching practicum. They were (i) general teaching methods (e.g., lesson plans and assessment strategies), (ii) research-based teaching findings, and (iii) sharing of teaching experiences and modelling by lecturers.

General Teaching Methods (e.g., lesson plans and assessment strategies). The pre-service teachers expressed how university course content on developing lesson plans had helped them tremendously during their teaching practicum. One pre-service teacher stated that the lesson plans during university courses were painstakingly developed, with various activities encouraging active learning. These were not the norm in schools. The pre-service teacher claimed that if she had relied on the mentor teacher, her lesson plans would predominantly be chalk-and-talk and written work to elicit student understanding. She added that her university courses had not favoured paper-and-pencil class activities as these tasks did not encourage active participation from students and often led to boredom among students.

> "At the university, we develop activities to encourage active learning… instead of using paper-and-pencil to test understanding, students get bored." (S1)

Lesson plans taught at the university helped cater to "students of different (ability) levels and, analyse and arrange the contents in a logical and sound manner*"* (S2). The pre-service teachers claimed they could carry out the lesson efficiently with better-organised lesson plans. To stress the importance of lesson plans, one pre-service teacher shared her experience when she did not have time to complete a lesson plan and found it difficult to conduct her lesson.

"I had tried teaching without a lesson plan at the beginning of LM (teaching practical), and it was not smooth at all." (S3)

The pre-service teachers claimed that the pedagogical knowledge learned on lesson plans at the university allowed them to achieve the learning objectives during their practicum.

"Planning/designing of chemistry lessons requires attention, especially to activities in the content development area so that learning objectives of the day are met." (S4)

Another aspect of pedagogical knowledge that these pre-service teachers found helpful was classroom assessment. They felt that learning about the assessment concepts allowed them to know if their students had achieved the learning outcomes for their lessons.

"Chemistry education courses provide me with an opportunity to learn about what we can do more for students through… formative and continuous assessment." (S1)

"It is very important to help the teacher to know whether the students have reached the LO (learning outcomes). Sometimes, when you teach them something, it looks like they understand. But after doing some exercises, the problem can be detected … like formative assessment …." (S3)

The concept of formative assessment taught in university was useful in their teaching practicum, especially to detect any learning difficulties and help students achieve their learning outcomes.

Research-based Teaching Findings. The students were exposed to various aspects of research-based teaching findings in their university courses. One example was using content representations (CoRes; Hume & Berry, 2011). CoRes helped pre-service teachers develop their pedagogical content knowledge (PCK) when engaging and constructing their CoRes.

"CoRes helped with the analysis of content and what and how we should prepare our lesson plan." (S2)

"I think everything that I learned during class is very helpful. … I was introduced to lesson plans, chunking method of chemistry syllabus, … the CoRe method." (S6)

Similarly, the introduction and discussions on research findings of common misconceptions in chemistry and the difficulty in learning chemistry because of the chemistry triplet model proposed by Johnstone (1993) seemed to help them in their teaching practicum.

"Aspects of the course content that are helpful in conducting my teaching practical are the misconception… the triplet model." (S7).

Sharing of Teaching Experiences and Modelling by Lecturers. Pre-service teachers found useful practices such as the sharing of teaching experiences by their lecturers.

"Some of the sharing from the lecturer, whether lecturer's personal or experiences from previous batches on how to approach certain topics are useful… we can mimic certain behaviour and not be taken aback when we experience a similar situation." (S2)

When asked to elaborate, S2 stated that the lecturer mentioned that their seniors had problems when dealing with difficult school students and advised them on how to handle and motivate them.

The pre-service teachers were also appreciative when teacher educators modelled constructivist classrooms during their university courses. They found that the lecturers did not just lecture but provided space and resources to engage in group work in a collaborative environment. These learning experiences, active and collaborative learning that lecturers modelled, were useful during their teaching practicum.

"Collaboration between classmates enable me to find out more activities, and we can discuss with Dr …." (S1)

"Having this experience, I think it is important because it gives students opportunities to talk and discuss their ideas… just as in the lecture, the lecturer can't do all the thinking for us. Very beneficial." (S4)

Inadequate Pedagogical Knowledge (University Courses)

The pre-service teachers elaborated four categories on the pedagogical knowledge (university courses) that were inadequate: (i) classroom management, (ii) online classes, (iii) completing official forms and school-level directives/paperwork and (iv) comprehensive lesson plan.

Classroom Management. The pre-service teachers expressed that the pedagogical knowledge they learned at the university was inadequate in controlling and managing classroom students.

"I had trouble figuring out how to control the class well because I was less exposed to the appropriate ways or techniques in the course." (S5)

"… class management techniques should be emphasised in this course. Ways to get the attention of students, especially those who are less interested in learning." (S6)

The pre-service teachers claimed they were not inadequately exposed to classroom management techniques and approaches, especially for students less interested in learning.

Online Classes. Many schools were doing online classes as these pre-service teachers conducted their teaching practicum during the COVID-19 pandemic. Thus, pre-service teachers felt that the university courses did not adequately prepare them for the challenges of online classes.

"I think the greatest challenge for me was to conduct the online class. It was very different with face-to-face class." (S3)

"I have full attendance … yet I feel I am speaking to the screen … group activities cannot be done, so we can only use PowerPoint… what can we do…" (S1)

"To develop practical skills is difficult during online teaching… so difficult and frustrating." (S4)

The pre-service teachers mentioned lacking various teaching strategies and mainly used PowerPoint presentations during online classes.

Completing Official Forms and School-level Directives/paperwork. Another challenge that these students encountered during their teaching practicum was concerning documents and record-keeping. The pre-service teachers claimed that paperwork or administrative documentation had a specific format to adhere to, and each school had guidelines for completing them.

"Aspects that I encounter during my practicum is the Pentaksiran Bilik Darjah or PBD (classroom assessment), where I was asked by my mentor teacher to fill in the form for subject science of Form 1 students. Since I never done it before, I hesitated whether I did it correctly or not while giving the marks for students." (S7)

"The university courses would not be able to prepare us with this (documents) because it is different ways done by different schools. Each has its own method, so it is difficult…." (S5)

Comprehensive Lesson Plan. Though all pre-service teachers underwent the same university courses, their experiences differed. For example, one of the pre-service teachers claimed that writing a comprehensive lesson plan as taught in university courses was unnecessary. She felt these comprehensive lesson plans do not necessarily translate to better student learning.

"The preparation of the lesson plan does not have to be too complicated but enough to achieve the learning objectives. This is because too many activities or plans do not determine the level of understanding of students." (S5)

Due to the overwhelming workload (teaching and documentation), S5 believed the lesson plan should not be too complicated. When asked what she meant by this statement, S5 stated that sometimes using the traditional chalk-and-talk method seemed better for students' understanding and achieving the learning objectives.

"I have tried with group work, but students talk and do nothing much, so the learning outcomes are not achieved. So, my guru pembimbing (mentor teacher) said just to use PowerPoint, and I think I can do the lesson much better." (S5)

It is to be noted that S5's comments about comprehensive lesson plans were antithetical to what her peers had stated.

Suggestions to overcome Inadequacies in Pedagogical Knowledge (University Courses)

The pre-service teachers provided suggestions for the inadequacies in pedagogical knowledge during their teaching practicum. Three themes emerged for suggestions to improve the inadequacies: (i) enhancing classroom management training, (ii) improving preparation for online classes, and (3) addressing documentation challenges.

Enhancing Classroom Management Training. Having access to a real-world classroom is impossible. Still, one of the pre-service teachers suggested that university courses incorporate projects or case studies to allow pre-service teachers to work with a small group of students (outside of school hours). By doing so, the pre-service teachers can use these experiences for their teaching practicum.

"I would like to suggest that novice teachers should do a project on how to tackle a chemistry learning problem by applying it to a group of students. This may help novice teachers to realise the real situation of students' struggle in learning certain topics or concepts in chemistry." (S7)

Improving Preparation for Online Classes. As per their course structure, not one course is fully dedicated to online teaching methods. Thus, the pre-service teachers suggested creating at least one course on conducting online classes.

"To create one course that only taught how to conduct an efficient online class." (S3)

"Teach how to design online courses so that we are sure that students would engage." (S1)

Addressing Documentation Challenges. To overcome the documentation issues, the pre-service teachers suggested that teacher educators compile samples of these forms and discuss them during lectures or invite schoolteachers to share their experiences on document filing.

"Lecturers can meet teachers and ask about these forms; so, they had them to discuss with us." (S4)

"May be invite teachers to talk about these forms…." (S1)

According to them, these suggestions could help them during their teaching practicum.

DISCUSSION

This study aimed to gain information on what pedagogical knowledge studied during the university courses was useful and what was inadequate. Alignment between their pedagogical knowledge and teaching practicum has proven to be effective in the success of teacher education programmes. Preparing lesson plans was voiced as an important component of their university courses that were inevitably also used in schools. The pre-service teachers had mentioned that they could plan for more constructivist pedagogies compared to what was popularly done in schools (Lim et al., 2018). Due to the tensions and pressure of completing the syllabus and preparing students for examinations, schoolteachers opted for more teacher-centred lessons.

Several pre-service teachers in this study had observed this discrepancy in student/teacher-centred instruction but persisted in implementing more student-centred activities. They elaborated that students gained a better understanding with more student-centred activities. The pre-service teachers persevered with lesson plans that were student-centred. Teacher education programmes should encourage pre-service teachers to develop "habits and skills necessary for the ongoing study of teaching in the company of colleagues" (Feiman-Nemser, 2001, p. 45). It is known as growth competency, which is difficult to acquire because it requires pre-service teachers to observe, interpret and analyse their classroom experiences. The question is how well teacher education programmes address these habits and skills.

Despite this study's small number of participants, one pre-service teacher seemed to have buckled under pressure and opted for more teacher-centred pedagogy. She had claimed that using constructivist pedagogies was "too complicated", so her "mentor teacher said to use PowerPoint". She claimed that her lessons were much better. This situation is the danger that Clift and Brady (2009) warned about: theoretical ideas of an ideal learning environment can be washed out when pre-service teachers are socialised into the workforce. They may "not base practice on theories and recommended practices from the teacher education programs" (p. 331). School teachers have been teaching with challenges such as classroom management and time

constraints. Still, university lecturers always lecture in a sterile environment, making it easy to conduct constructivist pedagogies (Toe et al., 2020). These environments (university versus school) of teaching and learning are also physically distinct and distant, making it difficult for pre-service teachers to consolidate these two worlds. The common way to reduce the divide would involve mentoring teachers and building authentic partnerships between pre-service teachers, mentor teachers, and university lecturers.

Literature has shown that even though these partnerships are effective, they are unsustainable (El Masry & Mohd Saad, 2017; Guise, 2013; Yamagata-Lynch & Smaldino, 2007). Since pre-service teachers in this study had voiced that teacher educators' experiences did help them during their teaching practical - it could be suggested that teacher educators go to schools and experience what it is to teach in an authentic teaching and learning environment (Flessner, 2012). This process does not have to be done annually because the teacher educators can sustain the experiences for longer. The knowledge and experiences that teacher educators gain through their interactions with school personnel, teachers and students could be shared with their pre-service teachers. Gaining these experiences first-hand equips teacher educators with the knowledge to facilitate pre-service teachers to consolidate their knowledge-practice divide.

The divide between pedagogical knowledge and teaching practicum in classroom management is prevalent for all pre-service teachers in this study. Even though these issues have been discussed theoretically, the pre-service teachers could not draw upon their knowledge to find solutions concerning classroom management during their teaching practicum. Classroom management issues are multifaceted (Sieberer-Nagler, 2015). For example, Wiseman and Hunt (2008) mentioned that discipline and punishment of students in the classrooms are not synonymous as there are four things that discipline can do to enhance engagement that punishment cannot. These nitty-gritty aspects of classroom management are overwhelming for pre-service teachers when learning how to teach (Junker et al., 2021). Pre-service teachers are unsure what and how to draw upon their vast educational theory for specific situations that arise in schools.

Nevertheless, we know greater emphasis should be placed on classroom management because poorly managed classes lead to student discipline problems and can inhibit effective instructional approaches (Darling-Hammond et al., 2020). Buchanan (2017) recommended that teacher educators use these divides as "pedagogical objects" rather than minimise the divide. The discrepancies, conflicting ideas, and disconnections between educational theory and pedagogical practices can be used as pedagogical tools. Teacher educators can use these divides as contextual learning, allowing pre-service teachers to explore the various approaches for bridging, manoeuvring,

and adapting conflicting ideas and beliefs. The experiences of exploring the divides of classroom management among pre-service teachers can be more meaningful if mentoring teachers are invited to participate. Pre-service teachers can be more confident and motivated to act when placed in the school environment by explicitly engaging with both sides of the coin.

When the pre-service teachers were asked to provide suggestions on how to reduce the theory-practice divide, one pre-service teacher stated that pedagogical knowledge learned at the university did not prepare her to do administrative work as it is unique to each school and suggested that schoolteachers should be invited during their university courses to help them gain that knowledge. Though it could be seen as a good suggestion, pre-service teachers prefer the transmission mode of training. In other words, do pre-service teachers prefer to learn from experts rather than take the initiative to learn during their school apprenticeship (Safari & Rashidi, 2015)? Teacher educators must ensure pre-service teachers understand that transmission approaches do not allow them to exhibit agency. Pre-service teachers should be educated to be thoughtful, intellectual, and innovative educators to be agentic change. For example, the unanticipated pandemic has caused the content of teacher education programmes to be inferior in online learning. The pre-service teachers expressed inadequacy in this aspect. Thus, pre-service teachers should be taught the skills of being flexible, agile, and competent

to face challenges and complicated school workloads more efficiently.

CONCLUSION

The research found that even with a few pre-service teachers, their input about the pedagogical knowledge learned at the university that was (un)useful for their teaching practicum varied widely. Since the theory-practice gap in teacher education is multifaceted and complex, unified efforts of educational administrators and school and university personnel are required to diminish the gap.

Thus, future research should continue to explore the multifaceted nature of the theory-practice gap in teacher education. Expanding the participant pool from the bottom up can provide a more nuanced understanding of the challenges and opportunities for reducing this gap. This study highlights the importance of assembling and analysing pre-service teachers' experiences during their teaching practicum as it can inform curriculum reviews. Asking pre-service teachers explicitly what pedagogical knowledge they found useful or inadequate as they complete their teaching practicum is one way for teacher educators to gain insights into the quality of their teacher education programme. Using their feedback, teacher educators can think of ways to align their university courses with school experiences. Designing a curriculum for teacher education programmes that considers everyone's voices is more likely to be comprehensive and holistic.

Limitation and Recommendation

The findings provide useful insights into the theory-practice divide. However, it is limited to only seven participants from a chemistry major. Future research needs to involve a more comprehensive coverage of participants, including various other subject majors, to gain in-depth descriptions of the cause and potential issues that might induce the existence of this theory-practice divide.

Given the wide variation in pre-service teachers' perceptions of the pedagogical knowledge learned at the university, it is recommended that a more deliberate effort to align the university coursework with the demands of teaching practicum. The obtained information can be systematically reviewed and incorporated into future university courses. Teacher educators then provide the appropriate scaffolding for pre-service teachers to transition to their teaching practicum. Knowing gaps in the theory-practice divide may provide insights for teacher educators to prepare their future cohorts better. The reduction of the theory-practice gap can lead to quality teacher education.

It is also recommended that more effort be made to redesign the education programme to move away from completing their university courses entirely before embarking on their teaching practicum. The current structure, where theoretical knowledge and pedagogical practices are done sequentially, does not give pre-service teachers a venue to think about their teaching practicum experiences, discuss these experiences with their peers, get scaffolding from lecturers and try alternative methods in following lessons.

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