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Beginning Teachers' Perceptions of their Pedagogical Knowledge and Skills in Teaching: A Three Year Study

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Abstract: The purpose of this paper is to investigate the beginning teachers' perceptions of pedagogical knowledge and skills in teaching in Singapore. Data was collected from the beginning teachers at three time points: the exit point of the teacher education programme, the end of their first year and third year of teaching. In this three year study, the focus is to examine the beginning teachers' perceptions of their development in the following teaching related factors: lesson planning, classroom management and instructional strategies. The results showed that beginning teachers' pedagogical knowledge and skills increased significantly, but at different rates, in all three factors at the end of their third year of teaching. It suggested that learning to teach is an on-going process that begins from the pre-service teacher education programme and continues into the initial three years of teaching.

Introduction

Efforts to increase teachers' proficiency and efficacy are critical components in making necessary changes to the education system (Darling-Hammond & Baratz-Snowden, 2005). Beginning teachers should have basic knowledge and skills of the pedagogical principles and the content knowledge in selected subject areas upon completion of their pre-service teacher education programme. Feiman-Nemser (2001) discussed that pre-service teacher education programmes laid a foundation of theories and offered opportunities for pre-service teachers to practise their teaching. However, these experiences are still different from the responsibilities and expectations of beginning teachers when they step into their own classrooms. In reviewing eleven studies on knowledge, skills and beliefs of pre-service teachers, Wilson, Floden, and Ferrini-Mundy (2002) concluded that beginning teachers lacked the conceptual understanding that is needed to respond to students' questions and the abilities to extend the lessons beyond the basics.

To meet the changing and increasing demands of education, schools are continually challenged to provide appropriate and timely professional development measures that will enhance beginning teachers' skills, knowledge, and attitudes. Research has confirmed repeatedly that a significant factor in raising students' academic gains is through the improvement of instructional capacity (Darling-Hammond, Chung, & Frelow, 2002; Marzano & Marzano, 2003). The challenge for school leaders and policymakers is to determine how best to provide high-quality professional development opportunities for their teachers. Beginning teachers are expected to continue to strengthen and enhance their pedagogical knowledge and skills through professional development during the initial

years of their teaching. More specifically, they are to hone their content knowledge, pedagogical knowledge and skills as they have their own classrooms and more contextualized knowledge of their students (Feiman-Nemser, 2001). Beginning teachers' perceived that their knowledge and skills increased significantly in areas such as accommodation of diversity and classroom management, and they also perceived significant increase in their skill of lesson planning after their first year of teaching (Choy, Chong, Wong, & Wong, 2011). However, the study only discussed the beginning teachers' first year development. In addition, it was found that limited studies have looked at the development of beginning teachers' perceptions of their pedagogical knowledge and skills in teaching during the first three years of their teaching. Hobson, Ashby, Malderez and Tomlinson (2009) concluded that the first three years of teaching experiences are crucial to the development of beginning teachers. Hence, there is a need to look at the development of beginning teachers' perceptions of pedagogical knowledge and skills in teaching beyond their first year of teaching. It is therefore timely that the present study was conceptualized and addresses the gap in this area.

The purpose of this study is twofold. The first purpose is to gain an understanding of beginning teachers' perceptions of their pedagogical knowledge and skills in teaching during the initial stage of their teaching career. The second is to examine if there are any changes in their perceptions as beginning teachers during the first three years of their teaching. Although this study is done in the context of Singapore education system, it hopes to add to existing research and literature on beginning teachers' development in pedagogical knowledge and skills in teaching. Data gathered as part of this study will be useful in informing teacher development programmes as well as teacher induction programmes of impending factors and areas to facilitate support for beginning teachers.

Literature Review

A review of the literature concerning quality teacher education indicates that there is a core body of knowledge and skills with which a teacher must be equipped with to provide them with the knowledge and skills of effective teaching (Darling-Hammond & Baratz-Snowden, 2005; Darling-Hammond, Wise, & Kline, 1999; Fajet, Bello, Leftwich, Mesler, & Shaver, 2005; Murphy, Delli, & Edwards, 2004; Ryan & Cooper, 2007). A key distinction between beginning and experienced teachers is in the degree of sophistication with which they exhibit their application of this set of knowledge and skills. To be effective, teachers need a variety of methods to identify strengths and weaknesses of individual learners, plan differentiated instructional activities for diverse learners, and assess students' knowledge for the purpose of integrating multiple pathways of instruction. Some categories in this set of knowledge and skills include: lesson planning, instructional strategies and classroom management.

Lesson Planning

Beginning teachers must be able to plan and provide a set of learning opportunities that offer access to crucial concepts and skills for all students. The first thing a teacher must do to design an effective classroom is to create a conducive learning environment that supports students' engaged learning and meaningful instruction. These elements of lesson planning serve as a guide for beginning teachers to use good pedagogy in the classroom. Lesson planning makes teaching more conscious and purposeful. Beginning

teachers will be able to articulate what they plan to do, what they do and why they do it to colleagues, parents and members of the public (Marzano, 2007).

Lesson planning is a critical component of the pedagogical reasoning of teachers. The literature discusses teachers' decision making for lesson planning in two ways: (1) the set of psychological processes in which a person visualizes the future, inventories means and ends, and constructs a framework to guide his or her action in the classroom or (2) the "things that teachers do when they say that they are planning" (Clark & Peterson, 1986, p. 260). Teachers must first use their context specific conceptions to select the appropriate content to teach, and then apply the teaching strategy that would be appropriate for the given context. Clark and Peterson (1986) noted that one of the key components of competence is that the teacher must choose a plan, goal or perspective that organizes the situation in order to avoid students being overwhelmed with information.

Instructional Strategies

Developing beginning teachers' instructional capability can be viewed as one of the most important roles of universities in the preparation of teachers. Darling-Hammond, Wise, and Kline (1999) described skilful instructional strategies as follows:

Teaching skills include the abilities to transform knowledge into actions needed for effective teaching - for example, abilities to evaluate student thinking and performance in order to plan appropriate learning opportunities; abilities to critique, modify, combine, and use instructional materials to accomplish teaching and learning goals; abilities to understand and use multiple learning and teaching strategies; abilities to explain concepts clearly and appropriately, given the developmental needs and social experiences of students; abilities to provide useful feedback to students in constructive and instructionally helpful ways. (p.39)

Beginning teachers must understand what the expected curriculum goals and outcomes are for students and what resources are needed in order to accomplish the goals. They need to understand how the curriculum they teach fits into the larger department or school curriculum and ultimately the national standards. Also, beginning teachers must connect their content knowledge with their knowledge of how students learn in order to instruct in a manner that is responsive to students' thinking (Feiman-Nemser, 2001).

Classroom Management

Classroom management is one of the key factors that will assist teachers in creating a classroom environment that will lead to higher order thinking and learning. Barbetta, Norona, and Bicard (2006) noted that a chaotic classroom that lacks boundaries can prevent students from being engaged in the learning activity and process. Beginning teachers must possess the skill of organizing a classroom which provides an orderly environment that increases academic engaged time and decreases distractions. Ryan and Cooper (2007) attributed a large portion of lost academic engaged time to teachers who do not know how to manage their classes resulting in students who are not productively engaged in the learning process. In a study on teacher beliefs by Minor, Onquegbuzie, Witcher and James (2002), in-service teachers highlighted classroom and behaviour management as one of the key domains of effective teaching. Although differences in preferences of classroom and behaviour management styles appeared in the study, classroom and behaviour management was rated as one of the most important characteristics of effective teachers. Certo's (2006) study with beginning teachers and their mentors found that classroom management and discipline were perceived as challenging.

A review of literature suggested that there are many factors contributing to beginning teachers' development of pedagogical knowledge and skills. However, lesson planning, instructional strategies and classroom management were areas that perceived as important by researchers and challenging by beginning teachers. Building on the findings from the previous studies, this paper will address the changes of the beginning teachers' pedagogical knowledge and skills in teaching in these three areas.

Rationale

The purpose of this paper is to investigate the development of the beginning teachers' self-perceived pedagogical knowledge and skills in their teaching related areas in Singapore. More specifically, this paper focused on the perceptions of the beginning teachers' pedagogical knowledge and skills in areas of lesson planning, instructional strategies and classroom management during their first three years of teaching.

The results shared in this paper were part of a four-year longitudinal study on teacher education programmes in Singapore. The longitudinal study collected data in areas such as reasons for becoming teachers, attitude towards teaching as a career, and the participants' levels of pedagogical knowledge and skills in teaching at the beginning of the pre-service teacher education programme, at the end of their programme, and at the end of their first year and third year of teaching. The results from this paper will be able to contribute to the mentoring and professional development for beginning teachers. Similar studies conducted were only able to report findings of the beginning teachers after their first year of teaching.

In this paper, the results of the beginning teachers' pedagogical knowledge and skills in their teaching will be discussed. Part of the data collected from the Pedagogical Knowledge and Skills in Teaching (PKST) survey (Choy, Lim, Chong, & Wong, 2012) was analysed to answer the following research questions:

- 1) What are the beginning teachers' pedagogical knowledge and skills in their teaching:
 - a. at the end of their pre-service teacher education programme?
 - b. at the end of their first year of teaching?
 - c. at the end of their third year of teaching?
- 2) What are their developments in pedagogical knowledge and skills during their first three years of teaching?

Methodology

Sample

The participants for this study were enrolled in the one-year Post Graduate Diploma in Education (PGDE) pre-service teacher education programme at the National Institute of Education (NIE), Singapore. They completed the PKST survey at three data collection points: the end of the pre-service teacher education programme, at the end of the first year of teaching and at the end of the third year of teaching. Among the 1000 participants who completed the end of teacher education programme survey, 358 of them who were still in the teaching service completed the survey at all three data collection points. Although most of the beginning teachers completed the PKST at the end of their programme, the response rate fell sharply at the end of the first and the third year of teaching. Some of the reasons for this drop could be that the beginning teachers may be teaching at another school, resigned from teaching, moved on to administrative positions at the Ministry of Education, and etc. The research team was unable to contact the

participants once they left their schools. In addition, the data collection period of this study spanned over three years. Hence these could explain why the response rate for the data collection for this study was only 38.5%. The average age of the participants is 25.3 (SD = 3.66), with over 60% of them between 21-25 years of age.

Instrument

This study adopted part of the Pedagogical Knowledge and Skills in Teaching (PKST) survey (Choy et al., 2012) to measure the beginning teachers' pedagogical knowledge and skills in teaching related factors. The instrument comprised 37 items with two 5-point Likert scales: one scale is for assessing pedagogical knowledge, ranging from: 5 as *highly knowledgeable* to 1 represent *no knowledge at all*; and the other scale is for assessing skills, ranging from: 5 as *extremely confident* to 1 as *no confidence at all*. Confirmatory factor analysis was used to validate the factor pattern and showed that the factors were an acceptable model fit (TLI = 0.92, CFI = 0.93, RMSEA = 0.05). The Cronbach alpha for the instrument was 0.97, which indicated it is fairly reliable (Choy et al., 2012).

Results

Findings from three selected factors in the PKST survey, namely Lesson Planning, Instructional Strategies, and Classroom Management were used to answer the research questions for this paper. These factors were selected as they directly related to the beginning teachers' day-to-day teaching responsibilities. There are seven items in the Lesson Planning factor, seven items in the Instructional Strategies factor and four items in the Classroom Management factor. The description for each factor and some sample items are listed in Table 1.

| Factors | Sample items |
|---|---|
| Lesson Planning (7 items) Description: Writing lesson plans and selecting appropriate strategies | <ul style="list-style-type: none"> • Choosing appropriate teaching strategies for teaching particular topics. • Planning lessons that take into consideration the different abilities of students. • Determining appropriate teaching methods. |
| Instructional Strategies (7 items) Description: Selecting appropriate resources and assessments to support teaching | <ul style="list-style-type: none"> • Acquiring appropriate teaching materials for my lessons. • Incorporating information and communication technology (ICT) effectively in the classroom. • Using appropriate forms of assessment. |
| Classroom Management (4 items) Description: Managing students' behaviours | <ul style="list-style-type: none"> • Using appropriate strategies to monitor student behaviours. • Managing student discipline. |

Table 1. Factors for Beginning Teachers' Pedagogical Knowledge and Skills in Teaching.

Other factors in the PKST survey were not included in this study, they are: Care and Concern, Accommodating Diversity, and Student Learning. The research team reviewed the factors carefully and decided that they are not directly related to the actual "day-to-day teaching" in classrooms. As a result, these factors were not discussed in this paper.

Multiple analyses of variance (MANOVA) for repeated measures were used to analyze the data and compare the development of beginning teachers' self-perceived pedagogical knowledge and skills in teaching. Further analyses were done by using t-tests

for repeated measures to compare the changes between the end of the teacher education programme and the end of the first year of teaching; and the end of the first year and the end of the third year of teaching.

Development of Beginning Teachers' Self-Perceived Pedagogical Knowledge in Teaching

MANOVA results showed that there were significant differences in the overall perceptions of beginning teachers' pedagogical knowledge in teaching. The overall average was 3.73 when they completed the pre-service teacher education programme. It increased to 3.76 at the end of the first year of teaching and further increased to 3.90 at the end of third year (Wilks' Lambda = 44.86, p-value < 0.01) (See Table 2).

When looking at the three Factors separately, there were significant differences in all three factors. The average for Lesson Planning was at 3.76 when the beginning teachers graduated from their pre-service teacher education programme. It was maintained at 3.77 at the end of the first year and increased to 3.89 at the end of the third year of teaching (Wilks' Lambda = 29.60, p-value < 0.01). For Instructional Strategies, the average for pedagogical knowledge remained unchanged at 3.85 at the end of the teacher education programme and the end of the first year of teaching. Then, it increased to 3.98 at the end of the third year (Wilks' Lambda = 24.95, p-value < 0.01). The Classroom Management factor was 3.60 at the end of the teacher education programme. It increased to 3.66 at the end of the first year and further increased to 3.82 at the end of the third year of teaching (Wilks' Lambda = 40.03, p-value < 0.01). The results showed that the beginning teachers' pedagogical knowledge in teaching increased significantly in all three teaching related factors from the end of the teacher education programme to the end of their third year of teaching (see Table 2).

| Factors | End of programme | End of first year | End of third year | Wilks' Lambda |
|--------------------------|------------------|-------------------|-------------------|---------------|
| Lesson Planning | 3.76 | 3.77 | 3.89 | 29.60** |
| Instructional Strategies | 3.85 | 3.85 | 3.98 | 24.95** |
| Classroom Management | 3.60 | 3.66 | 3.82 | 40.03** |
| Overall | 3.73 | 3.76 | 3.90 | 44.86** |

(*p-value < 0.05; **p-value < 0.01)

Table 2. Beginning Teachers' Development of Pedagogical Knowledge in Teaching.

Development of Beginning Teachers' Self-Perceived Skills in Teaching

The beginning teachers' development in skills in teaching yielded similar results as their pedagogical knowledge. MANOVA showed that there were significant differences when comparing the beginning teachers' perceptions of overall skills in teaching during the first three years of teaching. Their average in skills was at 3.53 at the end of the pre-service teacher education programme. Then, it gradually increased to 3.65 and 3.84 at the end of first year and third year of teaching respectively (Wilks' Lambda = 103.96, p-value < 0.01).

All three factors also showed significant differences in skills. Lesson Planning increased from 3.57 at the end of the teacher education programme to 3.67 at the end of first year of teaching. It further increased to 3.83 at the end of the third year of teaching (Wilks' Lambda = 70.28, p-value < 0.01). Their skills in Instructional Strategies increased from 3.73 to 3.77 after one year and then reached 3.93 at the end of the third year of teaching (Wilks' Lambda = 40.87, p-value < 0.01). Their Classroom Management skills was reported at 3.30 at the end of the teacher education programme which gradually

increased to 3.53 and 3.73 by the end of the first and third year of teaching respectively (Wilks' Lambda = 114.22, p-value < 0.01) (See Table 3). Further analyses using t-tests were conducted to investigate the changes of the beginning teachers' pedagogical knowledge and skills in teaching.

| Factors | End of programme | End of first year | End of third year | Wilks' Lambda |
|-----------------------|------------------|-------------------|-------------------|---------------|
| Lesson Planning | 3.57 | 3.67 | 3.83 | 70.28** |
| Instructional Support | 3.73 | 3.77 | 3.93 | 40.87** |
| Classroom Management | 3.30 | 3.53 | 3.73 | 114.22** |
| Overall | 3.53 | 3.65 | 3.84 | 103.96** |

(*p-value < 0.05; **p-value < 0.01)

Table 3. Beginning Teachers' Development of Skills in Teaching.

Pairwise Comparisons of Beginning Teachers' Self-Perceived Pedagogical Knowledge in Teaching

The comparisons of beginning teachers' changes in pedagogical knowledge in teaching showed mixed results between the end of the teacher education programme and the end of the first year of teaching. The t-test analysis showed that Classroom Management increased significantly from 3.60 at the end of the teacher education programme to 3.66 at the end of the first year ($t = -1.95$, p-value < 0.05) (see Table 4). However, there were no significant differences in Lesson Planning and Instructional Strategies.

When comparing between the end of first year and end of third year of teaching, there were significant increases in beginning teachers' pedagogical knowledge in all three factors. Lesson Planning increased from 3.77 to 3.89 ($t = -6.90$, p-value < 0.01). Instructional Support increased from 3.85 to 3.98 ($t = -6.40$, p-value < 0.01) and Classroom Management increased from 3.66 to 3.82 ($t = -6.83$, p-value < 0.01) (see Table 4).

| Factors | End of programme vs. End of first year | End of first year vs. End of third year |
|-----------------------|--|---|
| Lesson Planning | -0.23 | -6.90** |
| Instructional Support | -0.34 | -6.40** |
| Classroom Management | -1.95* | -6.83** |

(*p-value < 0.05; **p-value < 0.01)

Table 4. T-Tests Comparisons for Beginning Teachers' Pedagogical Knowledge in Teaching.

Pairwise Comparisons of Beginning Teachers' Self-Perceived Skills in Teaching

In the comparisons of beginning teachers' self-perceived skills in teaching, there were significant increases in Lesson Planning and Classroom Management from the end of the teacher education programme to the end of the first year of teaching. Lesson Planning increased from 3.57 to 3.67 ($t = -4.42$, p-value < 0.01) and Classroom Management increased from 3.30 to 3.53 ($t = -7.41$, p-value < 0.01). There was no significant difference in pedagogical knowledge for Instructional Strategies (see Table 5).

The comparisons between the end of first year and end of third year of teaching showed that there were significant differences in all three factors in skills. Lesson Planning increased significantly from 3.67 to 3.83 ($t = -8.41$, p-value < 0.01). Instructional Support increased from 3.77 to 3.93 ($t = -7.60$, p-value < 0.01) and Classroom Management increased from 3.53 to 3.73 ($t = -7.77$, p-value < 0.01) (see Table 5).

| Factors | End of programme vs. End of first year | End of first year vs. End of third year |
|---------|--|---|
|---------|--|---|

| | first year | End of third year |
|-----------------------|------------|-------------------|
| Lesson Planning | -4.42** | -8.41** |
| Instructional Support | -1.83 | -7.60** |
| Classroom Management | -7.41** | -7.77** |

(*p-value < 0.05; **p-value < 0.01)

Table 5. T-tests Comparisons for Beginning Teachers' Skills in Teaching.

Discussion

The purpose of this paper is to learn more about the development of beginning teachers' self-perceived pedagogical knowledge and skills in the factors that are directly related to their day-to-day teaching: Lesson Planning, Instructional Strategies and Classroom Management. In this three-year study, the data were collected from 358 beginning teachers during their first three years of teaching. When comparing their pedagogical knowledge and skills in teaching, MANOVA showed that there were significant increases between end of teacher education programme, end of first year of teaching and end of third year of teaching. Further analyses using t-tests showed mixed results between end of teacher education programme and end of first year of teaching. During the first year of teaching, the only factor that increased significantly in pedagogical knowledge was Classroom Management. Two out of the three factors, Lesson Planning and Instructional Support, increased significantly in skills between end of teacher education programme and end of first year of teaching. On the other hand, there were significant increases in all three factors in pedagogical knowledge and skills between end of the first year of teaching and end of third year of teaching.

Changes in Beginning Teachers' Self-Perceived Pedagogical Knowledge During First Three Years of Teaching

The results of this paper showed that the beginning teachers' self-perceived pedagogical knowledge for Classroom Management increased significantly at the end of first year of teaching. The change in Classroom Management knowledge might be because of the professional development courses that were provided to the beginning teachers. During the first year of teaching, all beginning teachers in Singapore are required to complete a Structured Mentoring Programme (SMP) which consists of four professional development courses. One of the courses was related to classroom management. The courses from SMP may have contributed to the beginning teachers' view that their pedagogical knowledge in classroom management continued to develop during their first year of teaching. Classroom Management skills would also naturally increase with greater experience gained in the classroom setting. This finding replicates what was reported in Choy et al. (2011).

On the other hand, the beginning teachers' self-perceived pedagogical knowledge for Lesson Planning and Instructional Strategies remained unchanged at the end of first year of teaching. The findings from lesson planning also echoed the results from previous studies where no significance was reported (Choy et al., 2011). This could be because the beginning teachers were trying to adapt to the school environment and struggling between their different job responsibilities. As a result, they may not be focusing on the development of their pedagogical knowledge in these areas yet. The attention spent on adapting to the demands of becoming a full-fledged teacher could be the reason why only one out of the three factors in pedagogical knowledge increased significantly during the first year of teaching.

There are significant increases in all three factors in their self-perceived pedagogical knowledge from the end of first year to the end of third year of teaching. This could be because the beginning teachers have become more settled in their schools and are more likely to be able to attend courses or read more about how to improve their pedagogical knowledge. In addition, the final data collection was done at the end of the third year of teaching, giving the beginning teachers two years to build up their pedagogical knowledge. As Certo (2006) suggested that lesson planning and instructional strategies were two main challenges faced by beginning teachers, the teachers in this study might have sought professional development opportunities to enhance their pedagogical knowledge in these areas. Furthermore, some of the beginning teachers could have begun their post-graduate degrees and as a result perceived that their pedagogical knowledge continued to develop during their second and third year of teaching. In addition, the beginning teachers in this study also perceived that their pedagogical knowledge and skills in day-to-day teaching continue to develop into the second and third year of teaching.

Changes in Beginning Teachers' Self-Perceived Skills During First Three Years of Teaching

The beginning teachers perceived that their skills in Lesson Planning and Classroom Management increased significantly in the first year of their teaching. Uhlenbeck, Verloop, and Beijaard (2002) suggested that beginning teachers organize and re-organize, structure and restructure their understanding of practice as they actively construct knowledge by interpreting events on the basis of existing knowledge, skills, and beliefs. Their prior knowledge about learning, teaching students, and subject matter play a pivotal role as interpretative lenses through which they make sense of their experience and determine how they frame and resolve teaching problems with their own classes. This study suggested similar results, where the beginning teachers might have perceived that their daily events, such as planning lessons and managing their own classes in school allowed them to continue to develop their skills in teaching during their first year of teaching. The development of Lesson Planning and Classroom Management skills continued to increase significantly at the end of the third year of teaching. This result implied that the beginning teachers continue to develop their skills during the first three years and it did not plateau after the first year of teaching.

For Instructional Strategies, as the beginning teachers are just trying to “survive” during their first year of teaching (Gilles, Cramer, & Hwang, 2001), some common challenges include adapting to the school’s culture, stimulating acceptable behaviours in their students, etc. They might not have much opportunity to look for resources or technology to complement their teaching. Therefore, skills in Instructional Strategies did not change significantly during the first year of teaching. However, as they continued into their second and third year of teaching, they might have started to find out how to enhance their teaching, and look for resources to do so. They may also have started to pay more attention to their students’ needs, rather than their own needs in the classroom. Therefore, it is not surprising that their skills in Instructional Support increased significantly at the end of their third year of teaching.

Conclusion

The purpose of this study is to investigate the development of beginning teachers’ self-perceived pedagogical knowledge and skills during their initial three years of teaching. The results of this study showed that the beginning teachers’ pedagogical knowledge and skills continued to develop and increase significantly in the first three years after they

completed their teacher education programme. A number of studies also concluded that the first three years of teaching experiences are crucial to the development of beginning teachers (e.g., Hobson, Ashby, Malderez & Tomlinson, 2009). They generally held survival-related concerns, such as completing the lessons and managing their classrooms. They actively engaged in self-discovery and exploration to test their knowledge and skills before moving on to an advanced beginner stage at the end of the first three years to recreate knowledge and handle other broader issues (Huberman, 1989). The National Bureau of Economics in the U.S. found that the development of teacher performance was the greatest during the first three years and there was little difference between teacher performances over the following years (Kane, Rockoff, & Staiger, 2006). All these findings suggested that the first three years is a significant period for monitoring teachers' development and performance. Although the results of this study showed promising development of the beginning teachers' perceived pedagogical knowledge and skills in teaching during the first three years of teaching, their actual practices were not being investigated. Future research could look into following a group of beginning teachers to observe the actual teaching practices during the first three years of teaching and comparing them with what they perceived. Further research may investigate whether these teachers' self-perceived pedagogical knowledge and skills continue to develop as they gain more experiences in teaching.

Becoming a teacher is an ongoing process that is initiated, not completed, in the formal pre-service education programme (Feiman-Nemser, 2001). The results of this study are consistent with previous literature on the knowledge and skills of pre-service and beginning teachers. The pre-service teacher education experience lays a foundation and offers practice in teaching during the practicum attachments. The initial years of teaching brings a shift in role orientation and an epistemological move from knowing about teaching through formal study to knowing how to teach by confronting the day-to-day challenges (Feiman-Nemser 2001). Some even described the beginning years of teaching as "survival" and "sink or swim" approach in learning to teach (Gilles et al., 2001). As beginning teachers experienced significant changes during the transformation from pre-service teacher education to professional practice, adequate support is essential in the process. Beginning teachers could be supported by a network comprising teacher educators, fellow beginning teachers, and experienced teachers so that they can continue to build on their foundational knowledge and skills obtained from their pre-service teacher education during their beginning years of teaching (Kane & Russell, 2005).

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