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Teacher Identity, Professional Practice, and Inquiry (PPI) in Teacher Education

The Professional Practice and Inquiry (PPI) course was introduced to equip pre-service teachers with the knowledge, skills and values required to develop them into reflective practitioners with a strong teacher identity. This study looks into the efficacy of the course in the preparation of thoughtful and reflective teachers. Self-reported questionnaires were administered to the pre-service teachers. Interviews were conducted to complement the quantitative findings. Findings suggested that pre-service teachers were (i) more aware of their teaching identity, (ii) perceived themselves as teacher inquirers, (iii) more able to engage in cognitive self-regulation and (iv) were more cognizant of their Graduand Teacher Competencies.

Keywords: teacher education; professional practice; teacher identity; inquiry

Introduction

The role of teachers has changed as the profile of learners become more complex in today's teaching and learning context. Educators today are called to recognise their roles as architects of the education environment who have to actively engage learners in their holistic development (Darling-Hammond, 2006; Author 2, 2012). They no longer merely impart facts and information (Korthagen & Kessels, 1999), but need to identify what is important for their learners' development. Such educators possess a clear understanding and firm belief of their roles as teachers and of what teaching and learning entails. They also need to 'have a unity of purpose in their personal aspirations, beliefs, interests and competencies with a view of impacting the next generation' (Tan, 2012, p. 6) and have a clear understanding of their personal purpose on teaching.

As architects of the classroom environment, teachers need to be able to inquire into their practices, reflect and think systematically from their practice and learn from experiences (Hattie & Clinton, 2001), which will inform their next classroom experience. The purpose of this study therefore is to study the efficacy of deliberate, structured reflection (via the

Professional Practice and Inquiry course) in developing a clear professional teacher identity and engaging pre-service teachers' cognitive self-regulation as they reflect on their teaching practice. Specifically, the research questions are: 'Will the PPI course develop teachers who are...?'

- (1) aware of their identity as teachers?
- (2) able to inquire into their teaching practices?
- (3) able to engage in cognitive self-regulation?
- (4) cognisant of the Graduated Teacher Competencies?

Teacher Education and Professional Practice and Inquiry (PPI)

Given the demanding role teachers play and the changing and diverse profile of learners today, it is essential for teacher education programmes to impart the essential skills for teachers to stay resilient to the challenges of the twenty-first century (Donnell & Harper, 2005). Creating a teacher identity and inculcating the habit of deliberate reflection and inquiry, learning and relearning, make up the professional practice of teachers (Groundwater-Smith & Campbell, 2010; Kemmis & Smith, 2008). It is only through questioning and challenging of experiences and held assumptions that professional learning and development can be extended (Hager & Kaye, 1992; Dewey, 1933).

Teacher identity refers to the self-concept or image that is central to the beliefs, values and practices that inform the teacher's actions (Knowles, 1992; Walkington, 2005).

Researchers elucidated that this state of 'being and becoming' is often shaped by the contextual factors, professional experiences and learning over time (Beijaard et al., 2004; Coldron & Smith, 1999; Connelly & Clandinin, 1999; Goodson & Cole, 1994; Schepens, Aelterman & Vlerick, 2009). Walkington (2005) went on to emphasise that the reflection on one's own perceptions, beliefs, experiences and inquiry into one's practices should be a core

practice among teachers as it informs their teacher identity. This study adopts the definition provided by Knowles (1992) and Walkington (2005), in which teacher identity refers to the self-concept that informs teachers' actions.

Inquiry refers to the application of scientific inquiry to the context of teacher education, allows for pre-service teachers to develop the dispositions, knowledge and skills needed for the acquisition of deeper understandings (Donovan & Bransford, 2005). The pre-service teacher's inquiry process begins with them posing a question on teaching or learning, collecting data and relevant literature, analyse data, and applying the insights to future practice. This is followed by sharing their findings and implementations with mentors, supervisors and colleagues, thus articulating their inquiry process and opening it for feedback (Dana & Yendol-Hoppey, 2008, 2014). The inquiry process facilitates pre-service teachers' learning and informs their selection, use and innovation of teaching pedagogies to maximise students' potential (Schön, 1988).

Inquiry helps to facilitate the development of teacher identity in educators (Kemmis & Smith, 2008). When conceptualised as 'inquiry-as-stance' (Cochran-Smith & Lytle, 1999), pre-service teachers' inquiry is seen as a way of 'reflecting on and documenting the relationships among teacher learning, student learning, and professional practice' (Donnell & Harper, 2005, p. 154). By inquiring and examining their own understandings of teaching, pre-service teachers question, think, discuss and in turn raise the awareness of their personal understandings, values and dispositions towards teaching and being a teacher. This encourages self-awareness and solidifies their roles as educators (Weshah, 2013). As an educator's identity becomes clearer and more solidified, they become increasingly adept in adapting to the complexities of the classroom and today's education environment.

PPI at National Institute of Education (NIE)

Informed by research (Dewey, 1933; Hatton & Smith, 1995) that highlight the importance of inquiry in teacher education programmes, NIE has introduced the PPI course to prepare pre-service teachers for reflective practice and to strengthen their teacher identity and purpose. This course seeks to develop pre-service teachers with a clear teacher identity, who are able to reflect upon their roles as educators, inquire about their own practices and draw on theories and research to create new teachings aimed at improving the learning of students (Darling-Hammond, 2006). Recognizing the urgency of preparing pre-service teachers who inquire into their practice at the beginning of their initial teacher training programme (Saad & BouJaoude, 2012), the PPI course facilitates reflection and inquiry across all the content curricula and practicum experience (Author 1, in press). This structure as conceptualized in Figure 1 in Appendix A allows pre-service teachers to constantly clarify their teaching purpose and identity as they move through programmes of teacher education and as they interact with other educators within the education fraternity (Beauchamp & Thomas, 2009). This imbues reflection within and throughout the initial teacher preparation programme at NIE (Yost, Sentner, & Forlenza-Bailey, 2000).

NIE's PPI course begins with weekly one-hour lectures across 10 weeks. During this time pre-service teachers are taught on topics such as (i) understanding the 'why', 'what' and 'how' of the PPI, (ii) understanding the fundamentals of good teaching and learning (e.g. subject mastery, understanding how students learn and how learning takes place and understanding the psycho-social environments, teacher-student relationship, classroom diversity and student needs), and how they may use that to (iii) inform and formulate one's teaching beliefs, (iv) understand the inquiry process and (v) how relevant data can be used to substantiate and inform their inquiry.

As part of the course, pre-service teachers are also required to build their e-Portfolio. The e-Portfolio is an electronic collection of artefacts and evidences relating to the pre-service teachers' development and achievements (Gray, 2008). In NIE, it is used as a tool to (i) facilitate the articulation of their teaching beliefs and philosophy, (ii) share their conception of what teaching and learning entails and (iii) make visible their inquiry into their own practice especially during their Focused Conversations (FCs) and pre- and post-practicum conferences with their School Coordinating Mentor (SCM), Cooperating Teachers (CTs) and NIE Supervisor (NIES) respectively.

As an overall in charge of all matters relating to the practicum experience in the school, the SCM oversees the work of the CTs and pre-service teachers, and closely communicates with the NIES on matters pertaining to the practicum learning experiences and performance of pre-service teachers in the school. Induction briefings as well as the facilitation of observations and FCs are facilitated and conducted by the SCM.

The role of the NIES is that of a supervisor, counselor, evaluator and liaison person as he/she guides the pre-service teachers in classroom teaching and management, lesson planning and consolidation of learning. As an advocate for the pre-service teachers, the NIES also provides counsel concerning professional growth and progress of the pre-service teachers.

The CTs work closely with the pre-service teachers during the practicum experience. CTs are to assist in integrating the pre-service teachers into the school culture and environment and guide the pre-service teachers by observing, advising and providing feedback on strengths and weaknesses in the classroom. The CTs evaluate, together with the SCM, the progress of the pre-service teachers.

The varying roles of the SCM, CTs and NIES are part of the PPI structure to provide opportunities for pre-service teachers to share and discuss their experiences, engage in purposeful reflection, and nurture habits of inquiry into their teaching.

The PPI course provides affordance for constant planning, monitoring and reviewing of pre-service teachers' teaching practices with the structure afforded within the practicum experience. The PPI course and the e-Portfolio are seamlessly weaved into the pre-service teachers' practicum experience. Pre-service teachers articulate their teaching philosophy, share their conceptions of teaching and learning, and inquire into their classroom practices during their practicum experience through the use of e-Portfolio with their SCMs, CTs and NIESs during the FCs and pre- and post-practicum conferences. This inevitably facilitates a culture of learning among pre-service teachers as they clarify their professional teacher identity and share their inquiry into their teaching practice. Pre-service teachers are empowered to take ownership of their learning and development (Weshah, 2013) which puts them in good stead when they formally enter into the education fraternity (Groundwater-Smith & Campbell, 2010) as inquiring teacher professionals who are able to adapt and innovate pedagogies aimed at improving learners.

Methodology

Participants

The participants in this study were pre-service teachers ($N = 479$, 164 males, 315 females) from the July 2014 intake of the PPI course in the Post-Graduate Diploma in Education (PGDE) programme in NIE, Singapore. In addition, 10 pre-service teachers were randomly selected for the face-to-face interview after their practicum experience (10 weeks) in schools.

Measures

The initial development of the items was theoretically guided by the literature review and practically informed by experts of inquiry and professional practice, within the context of teacher education in NIE so as to ensure the content and face validity of the items.

The survey questionnaire administered examined six aspects of what it means to be an inquiring teacher professional. They are (i) pre-service teachers' awareness of their Teacher Identity (TI), (ii) their perceived ability of themselves as a Teacher Inquirer (TIn), (iii) their perceived attainment of the Graduand Teacher Competencies (GTCs) and their (iv) self-perceived ability to self-regulate cognitively through Planning (PI), (v) Reviewing (RE) and (vi) Monitoring (MO). Pre-service teachers rated each item using a 5-point Likert scale with 1 labelled as *Strongly Disagree* and 5 as *Strongly Agree*.

Awareness of Teacher Identity (TI)

In preparation for their pre-practicum conference and the first FC, pre-service teachers reflect on questions such as 'what does it mean to be a teacher in the current context?' and 'what is your teaching philosophy?' During the pre-practicum conference, pre-service teachers will share with their NIES what they have learnt from the courses in NIE that have shaped and influenced their professional teaching philosophy. During this session, the NIES will offer feedback for pre-service teachers to better integrate and aggregate their learning in NIE. This allows pre-service teachers to incorporate comments from their NIES and better refine their synthesis of learning and clarify their professional teacher identity before their first FC presentation to their SCM, CTs and school personnel. These structured conversations provide pre-service teachers with opportunities to purposefully reflect and articulate their teaching philosophy and teaching beliefs that inform their professional teaching identity. In this study, the perception of awareness of teacher identity is measured by six items. A sample item

reads, 'I have developed my professional identity as a teacher'.

Teacher Inquirer (TIn)

Teacher inquiry is an intentional and planned reflection that includes a heightened focus on problem posing where thinking and reflection are made public for discussion, sharing, debate, and purposeful conversation (Dana & Yendol-Hoppey, 2014). Approaching the middle of their practicum experience, pre-service teachers will attend the second FC, where they bring up for discussion issues pertaining either to classroom management or on the motivation of students and instructional strategies. As pre-service teachers inquire into their practice, they use the NIE's Reflective Practice Model (adapted from York-Barr, Sommers, Ghore, & Montie, 2001) to provide the structure to guide them through the process of reflection. Questions include (i) What happened? (ii) Why? (iii) So what? and (iv) Now what?. When reflecting on 'What happened?', pre-service teachers identify a problem and its specific inquiry questions. In order to address to their inquiry questions, pre-service teachers need to understand the 'Why?', the possible facts, concepts, theories and ideas drawn from relevant prior literature studies to help them understand why things happened in that way in the class. As the pre-service teachers deliberate on the 'So what?' and 'Now what?', it is crucial that they think through what are the data such as oral feedback from students, test scores and classroom observations they would want to collect to inform them of their practices. During the third FC that occurs during the final week of their practicum experience, and during their post-practicum conference, pre-service teachers share the area of their inquiry, the relevant data they have collected and how they make refinements to their teaching practice. As they engage in the discursive nature of the FCs facilitated by their SCM and NIES, the pre-service teachers develop a disposition of inquiry into their teaching practices, aimed at innovating pedagogies to meet the diverse learning needs of their students.

This process enables pre-service teachers to engage not only in reflective practice but require them to ‘support with evidence the decisions they make as teachers and subsequently advocate for changes in their teaching practices, curricula and pedagogy’ (Dana & Yendol-Hoppey, 2008, p. 17). The self-perceived ability of pre-service teachers in being effective inquirers was measured with seven items in this study. A sample item reads, ‘When reflecting on my teaching, I have a question (s) in mind’.

Cognitive Self-Regulation

Pre-service teachers are engaged in cognitive self-regulation as they learn to identify a problem, learn how to collect data to demonstrate this, and to select and carry out appropriate strategies to address the issue and share their results. During this process of inquiry, they discuss with peers, CTs and the SCM on the strategies that worked for them as well as those that did not. The guiding role of the SCM and the discursive nature of the second FC assist pre-service teachers to deepen their inquiry process as they co-construct knowledge and share experiences together as educators. Cognitive Self-Regulation for this study is adapted from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1993) and Schraw and Dennison’s (1994) Metacognitive Awareness Inventory (MAI). The MSLQ is a self-reported instrument designed to measure the learners’ motivation and self-regulated learning whereas the MAI is a self-report instrument designed to measure the learners’ awareness of their metacognitive processes (Cannella et al., 2001). The self-perceived ability of pre-service teachers who engage in cognitive self-regulation by Planning (PI), Reviewing (RE) and Monitoring (MO) was measured with four items each. In accordance to Cannella and colleagues (2001), PI measures the extent of planning, goal setting, and resource allocation undertaken by the teacher prior to their class, with a sample item reads, ‘I think about what I really need to do before I begin to teach’; RE measures the

evaluation and extent of the teachers' analysis of their own teaching and effectiveness of the strategies used in the classroom, with a sample item reads, 'I go through what I have learned to prepare for teaching'; and MO measures the teachers' ability to assess and adjust their learning and strategies use, with a sample item reads, 'I pause regularly to see if I am on track for my teaching'.

Graduand Teacher Competencies (GTCs)

During the third FC, pre-service teachers also share on how the practicum experience has helped increase their cognizance of the Graduand Teacher Competencies (GTCs) and how these GTCs have been developed. Graduand Teacher Competencies is a set of competencies identified by NIE as a benchmark of professional standards for NIE graduands. The GTC uses three performance dimensions namely, *Professional Practice, Leadership & Management* and *Personal Effectiveness* (NIE, 2009). For example, under *Professional Practice*, some of the core competencies includes nurturing the whole child and quality of learning of a child. Pre-service teachers are required to meaningfully select and showcase artefacts from their e-Portfolio that they have developed over the 10 weeks to demonstrate the development of the competencies that they have attained and also reflect on how the use of the inquiry has been useful in facilitating the developments of these competencies. The articulation of their inquiry processes, collection of data to inform of their practices and selection of artefacts allow for the personal values and beliefs on teaching and learning of pre-service teachers to be surfaced. In order for pre-service teachers to successfully transit and integrate into the teaching fraternity, they need to be able to possess a strong sense of their personal identity that is connected to their professional teaching identity and competencies. In this study, the GTC items measure the extent of the GTCs. A sample item reads, 'I can present evidences for each of my GTCs'.

Data Collection

The questionnaire was administered at two separate time points, the first (T1) was administered during the first lecture of the course and the second (T2) was administered after pre-service teachers' practicum experience. All pre-service teachers were informed that all data collected would be kept strictly confidential. Consent was sought from the participants at the start of the survey questionnaire, before they proceeded with answering the questions. The pre-service teachers were also made aware that they could choose not to participate in the study at any point without facing any form of penalties.

The face-to-face semi-structured interviews were conducted by a research assistant with 10 randomly selected pre-service teachers to gather more insights to explain and extend the findings gathered from the quantitative study. The interviews were conducted after the practicum experience of the pre-service teachers, on campus and at a time of convenience to each participant. The invitation to participate in the interview was randomly sent to pre-service teachers and the first 10 pre-service teachers who accepted the invitation were interviewed. The interviews were conducted after pre-service teachers completed the survey questionnaire at T2.

A few sample questions read 'Why is it important to have a teaching philosophy?', 'How does the Reflective Practice Model help you scaffold your reflections, inquire and refine your teaching practices?' and 'How does the PPI course facilitate you to have greater awareness of the GTCs?'.

The pre-service teachers were given a brief background of the project and consent was sought from them to be audio recorded before the recording began. They were also notified that they may discontinue their participation of the face-face interviews at any time and were not obliged in any way in continuing with the interviews or answering any

questions should they wish not to. All interviews were conducted in a tutorial room on campus with the interviewer and interviewee alone.

Results and Analyses

Confirmatory Factor Analysis (CFA)

For the validation of the instrument, CFA was conducted to test the factor structure of the scores obtained from the 29-item questionnaire using AMOS 23 (Arbuckle, 2011). The CFA comprised a six-factor model consisting of TI, TIn, GTC, PI, RE and MO (see Figure 2 in Appendix B). Results showed that all the standardised factor loadings were statistically significant and substantial ($>.40$). RMSEA with values around .05 demonstrate excellent fit (Brown, 2006; Browne & Cudeck, 1993; Marsh, Balla, & Hau, 1996) whereas TLI and CFI values greater than .90 and .95 are indicative of acceptable and excellent fit respectively (Hu & Bentler, 1999; McDonald & Marsh, 1990). Thus this model fits the data well ($\chi^2 = 768.74$, $df = 335$, TLI = .92, CFI = .93, RMSEA = .05) and further affirmed the within construct validity of the measurements. Furthermore, the good fit of this model provides sound measurement basis for testing the research questions in this study. Table 1 (Appendix C) shows the standardised parameter estimates in the six factor measurement model used.

Descriptive Statistics

Table 2 (Appendix D) presents the means, standard deviations, and Cronbach's alpha for the six factors respectively. The mean score of each factor was calculated by taking the mean of the number of items which constituted each factor. The reliability coefficient for each factor namely TI, TIn, GTC, PI, RE and MO are .80, .79, .95, .80, .70 and .82 respectively, indicating good reliability.

Zero-order Correlations

Zero-order among the variables at T1 and T2 are presented in Table 3 (Appendix E) and Table 4 (Appendix F) respectively. At T1 and T2, all variables are significantly correlated.

Paired-samples t-test

In order to examine the effect of the PPI course in facilitating pre-service teachers' (i) perceived awareness of their teaching identity, (ii) perceived ability in inquiring into their teaching practices, (iii) perceived awareness of attaining the GTCs, (iv) perceived ability to cognitively self-regulate by planning, reviewing and monitoring, paired-samples t-test was conducted for two time points (T1 and T2) for the six factors (TI, TIn, GTC, PI, RE and MO). The results of the paired-samples t-tests and their effect sizes (Cohen's *d*) are presented in Table 2. In accordance to Cohen (1988), $d = 0.2$ indicates a small effect size, whereas $d = 0.5$ and 0.8 indicate medium and large effect size.

Table 2 showed that there was a significant increase in pre-service teachers' perceived awareness of their teacher identity, T1 ($M = 3.75$, $SD = .47$) to T2 ($M = 4.10$, $SD = .55$), $t(478) = 11.90$, $p < .001$, $d = 0.54$. The pre-service teachers also perceived themselves to be better able to inquire into their teaching practices, T1 ($M = 4.08$, $SD = .41$) to T2 ($M = 4.19$, $SD = .48$), $t(478) = 4.42$, $p < .001$, $d = 0.20$. They were also perceived to be more cognizant of the GTCs, T1 ($M = 2.91$, $SD = .81$) to T2 ($M = 3.88$, $SD = .55$), $t(478) = 22.80$, $p < 0.01$, $d = 1.04$. The pre-service teachers also perceived themselves to be better able to self-regulate cognitively by planning for their teaching, T1 ($M = 4.00$, $SD = .48$) to T2 ($M = 4.14$, $SD = .48$), $t(478) = 4.69$, $p < 0.01$, $d = 0.21$. They also perceived to be better able to self-regulate their cognition by reviewing what they have done for their teaching, T1 ($M = 3.90$, $SD = .46$) to T2 ($M = 4.08$, $SD = .47$), $t(6.48) = 478$, $p < 0.01$, $d = 0.30$. Pre-service teachers also perceived to be better able to self-regulate their cognition by

monitoring their progress as a teacher every now and then, T1 ($M = 3.97$, $SD = .48$) to T2 ($M = 4.12$, $SD = .46$), $t(5.65) = 478$, $p < 0.01$, $d = 0.26$.

Qualitative Results

Qualitative data was collected from interview sessions conducted with the pre-service teachers after their practicum experience to explain and extend the quantitative findings. Content analysis was used on the collated qualitative responses. Essentially, content analysis is a technique for ‘making inferences by objectively and systematically identifying specified characteristics of messages’ (Holsti, 1969, p. 14) and allows for inferences to be made which can be corroborated with the results of the quantitative survey. In the current study, content analysis was done via coding and categorizing of the data. Specifically, a category is accepted to be ‘a group of words with similar meanings or connotations’ (Weber, 1990, p. 37). Following the recommendation by U.S. General Accounting Office (1996), the categories identified in the current study were meant to be mutually exclusive and exhaustive. The categories were established through emergent coding.

In this process, two researchers (Principal Investigator and research assistant) of this research independently reviewed the pre-service teachers’ responses and each came up with a set of categories. The two researchers then discussed and agreed on a final set of categories that best described the findings. Thereafter, the pre-service teachers’ reflections were re-read and categorised according to the final set of categories. For instance, one of the researchers proposed an initial category of ‘PPI course facilitates the articulation of teaching philosophy’ which was different from the category identified by the other researcher which was ‘PPI course facilitates the development of clear teacher identity’. After reading through the responses again, the researchers agreed that the category should be ‘PPI course facilitates the development of clear teacher identity’. This is because the pre-service teachers’ responses

showed that the PPI course did not merely facilitate their articulation of teaching philosophy but it helped in the crystallisation of their teacher identity. The final set of categories are presented below with interview verbatim from the participants.

PPI course facilitates the development of clear teacher identity

When asked on the importance of having a sound teaching philosophy and being cognizant about the GTCs, pre-service teachers acknowledge their usefulness in informing their teaching and serving as an anchor and foundation to their teaching identity. One pre-service teacher mentioned that ‘... we need to have a philosophy because, it guides you ... in your teaching, and I guess when things don't go very right, it also serves as a reminder on why are you here for in the first place’ Another pre-service teacher also shared that when she revisited her teaching philosophy at the end of her practicum, it was brought to her consciousness that the teaching approaches she employed in her class were aligned with her teaching philosophy.

... I started off with a teaching philosophy but through the practicum I didn't really think much about it. But, when I... look back at it, I felt that it reminded me of what I did. [For example] When I recently reviewed it, I thought okay yes I really, somehow applied it ...I guess [for example] developing like their joy in learning? I [recalled] myself coming up with creative ways to teach them and I could really see [them enjoying the lessons from feedback] cards and things like that [that] they wrote.

Also, being aware of the GTCs facilitates the development of one's teacher identity as reflected below:

... [when you look at the GTCs, you know that] these are the things ... for a competent teacher ... you should fulfill. Especially when doing the e-Portfolio ... you know you have to look at the table and see what you did. [By] consolidat[ing] what you did that falls into each competency ... it is also a reassurance to you when you see that okay,

actually I did manage to do this, I'm on the right track, I should continue doing more of this... [and to understand] what kind of teacher am I more inclined towards.

PPI course facilitates the formation of habit of reflection and inquiry

When asked if the reflective model scaffoldings provided by the PPI course was useful in helping form a habit of reflection and inquiry, pre-service teachers responded that the model had guided their inquiry process.

Of course it helps! Guidance. What happened. Why do you think it happened. So what, what have you learnt from this ... So in the future how do you want to deal with this if it happens again... I have something to refer to all the time.

Another pre-service teacher recounts how he managed discipline issues in the classroom and highlights the importance of reflection in being able to inquire effectively into one's practice.

I must go and reflect... [Initially] I was quite stern with [the student]. Then I realised that it's not working [as] I sense he's drifting away from me. So I got to think through what I can do other than going head on with him. [I recalled learning] about all these discipline model [in NIE]. It's good that [we get exposed] to some potential issues before we start our teachings.

PPI course facilitates the cognitive self-regulation of planning, reviewing and monitoring

When asked on how the PPI course facilitated pre-service teachers to self-regulate cognitively to think about their own learning through data collection and analysis, one pre-service teacher shared:

...anyone can do [data] collection... it's a very systematic and replicable process... I think [what] would be most challenging for me was actually interpreting the [data] ... interpreting data was something most useful because once I interpreted [the data], I can do something with it, because data by itself is meaningless, it's just numbers [on] the

papers, just words on the papers but what you make sense of it, that transform your teaching experience.

PPI course facilitates greater awareness and embodiment of GTCs

When asked whether the PPI course facilitated greater cognisance of GTCs, pre-service teachers shared that the heightened awareness of the GTCs led to more intentional development of their professional competencies.

... Yes [I found myself] developing the GTCs... [As I reflected on my practicum experience,] students approach me to talk about ... change of subject combination [and I was] in a way like a listening ear to them, helping them to value their options, [and] helping them to develop [their potential] ... Another competency would be on working in teams. [When] working [with] the unit, [I] shared what I picked up from NIE... with the team and ... eventually [they] used it during their lecture demonstrations ... which helped the student[s].

Discussions and Limitations

The results showed that the largest significant increases were observed in pre-service teachers' awareness of their teacher identity and development of GTCs after the PPI course. The effect sizes were found to be medium and large respectively. A more in depth analysis of the correlation table reflected that there was an increase in the correlation strength between pre-service teachers' awareness of their teacher identity and their development of GTCs after the PPI course. NIE pre-service teachers' identity seems to become increasingly associated with NIE's GTCs after their course. The qualitative findings also showed that pre-service teachers perceived the PPI course to facilitate the development of a clear teacher identity and heightened awareness and embodiment of their GTCs. This seems to suggest as pre-service teachers formulate, articulate, clarify and solidify their teacher identity throughout the PPI course they become more cognizant of the development of their GTCs. This is of pivotal importance in initial teacher preparation programme as the pre-service teachers' beliefs of

what teaching and learning entails will serve as a frame for their classroom practices, anchor when they face challenges in the classroom and guide for the development of their competencies.

Similar significant increase was seen for pre-service teachers' perceived ability to inquire into their practices after the PPI course. There was also an increase in correlation between pre-service teachers' perceived teacher identity and their ability to inquire into their practices at the end of the course. As suggested by Walkington (2005), teacher's beliefs, values and practices inform their actions. This seems to indicate that as the teachers are more aware of their teacher identity, more inquiry and intentionally planned reflection would be conducted in order for their actions to be congruent with their teacher identity. It is also possible that when pre-service teachers engage more in teacher inquiry, they are more aware of their teacher identity.

Pre-service teachers' perceived ability to engage in cognitive self-regulation also significantly increased after the PPI course. Together with increased correlation strengths between pre-service teachers' perceived ability to inquire into practice and their perceived cognitive self-regulation of planning, reviewing and monitoring, it can be speculated that after the PPI course, the pre-service teachers inquire more into their classroom practices and they can rely more on the strategies of planning, monitoring and reviewing as they go about their teacher inquiry. Indeed, through the interviews, pre-service teachers reported that the reflective model introduced during the PPI course has serve as a guidance in their inquiry process and aids in forming a habit of inquiry. Furthermore, through the interviews, pre-service teachers reported that the FC sharing sessions and artefacts collected provide a platform for pre-service teachers to create awareness on their planning for the classroom practices, reviewing on what they have done, and monitoring their progress as an educator. They also mentioned they did not merely collect data and responded to it but they interpreted

and searched for meaning from the data in order to ‘do something with it, [or the] data by itself is meaningless’.

Findings from this research also indicated much stronger correlations between pre-service teachers’ awareness of their GTCs and their cognitive self-regulation of planning, monitoring and reviewing after the course. As pre-service teachers were required to present artefacts as evidence for their GTC development during the final FC, they are made aware of their development as a professional educator. When the pre-service teachers are more aware of their GTCs, it allows them to identify the areas they have achieved and also areas that needed improvement. In the process of developing their GTC, the pre-service teachers are, at the same time, inquire into their practice and engage in self-regulation cognitively. On the other hand, it is also true to say that as the pre-service teachers engage in cognitive self-regulation, they are enhancing their professional competencies and thus the increase in their awareness.

These results are evident to the function of PPI course in NIE as the pre-service teachers are now more aware of their identity as a teacher, perceive themselves to be better able to inquire into their practices and are cognizant of the development of their teacher competencies. As identified by Saad and BouJaoude (2012, p. 126), ‘pre-service teachers should learn about inquiry and experience it and become more comfortable in doing it while in-service teachers need to receive continuous professional development and support to increase the possibility of implementing inquiry’.

It is important however, to note that there are limitations in this study. This research was positioned as part of the transformation for teacher education in NIE and the PPI course is for all pre-service teachers enrolled in the PGDE programme. As such, there is an absence of control groups in this study. In addition, future research may want to identify and examine

key elements of the cognitive and metacognitive processes of pre-service teachers as they inquire into their practice as this will inform future implementations of the PPI course.

The findings of the study therefore corroborate existing research on professional practice and inquiry in teacher education by recognizing that the articulation of ones' inquiry process and visibility of ones' reflection is seminal to developing professional educators who are able to engage in cognitive self-regulation and who possess a clear professional teaching identity.

Conclusion

The implementation of the PPI course is integrated together with practicum experience to provide pre-service teachers with the fundamental knowledge, dispositions and skills to make their professional growth as a teacher more meaningful. This study offers new perspectives in enhancing the professional practice implementations in teacher education, thus allowing more opportunities for pre-service teachers to 'learn about inquiry and experience it and become more comfortable in doing it' (Saad & BouJaude, 2012, p.126) before they integrate fully into the education fraternity. It also highlights the importance of making visible the teaching beliefs of an educator as it plays a central role in the teaching practices of teachers (Beswick, 2005), and influences the formation and re-formation of one's disposition, habits and skills that form the professional standards of the educational fraternity (Weshah, 2013).

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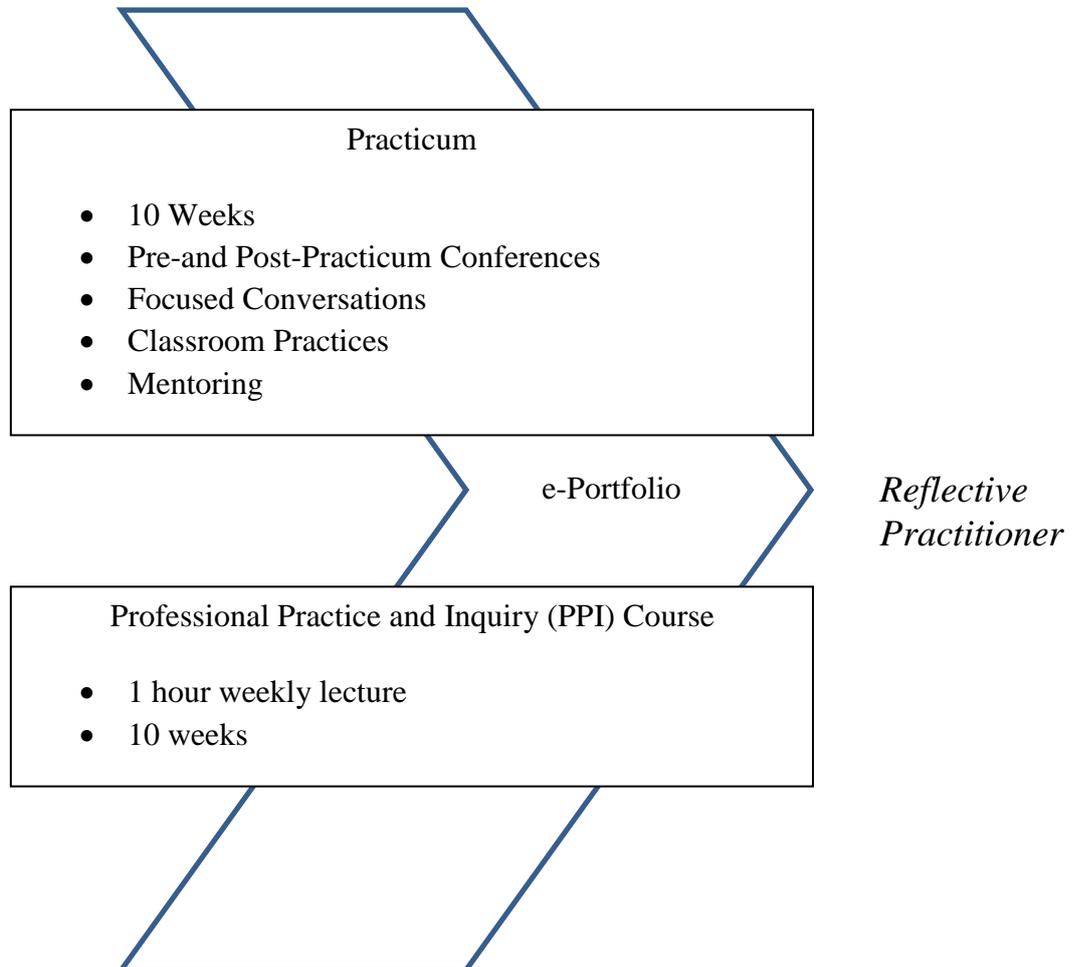
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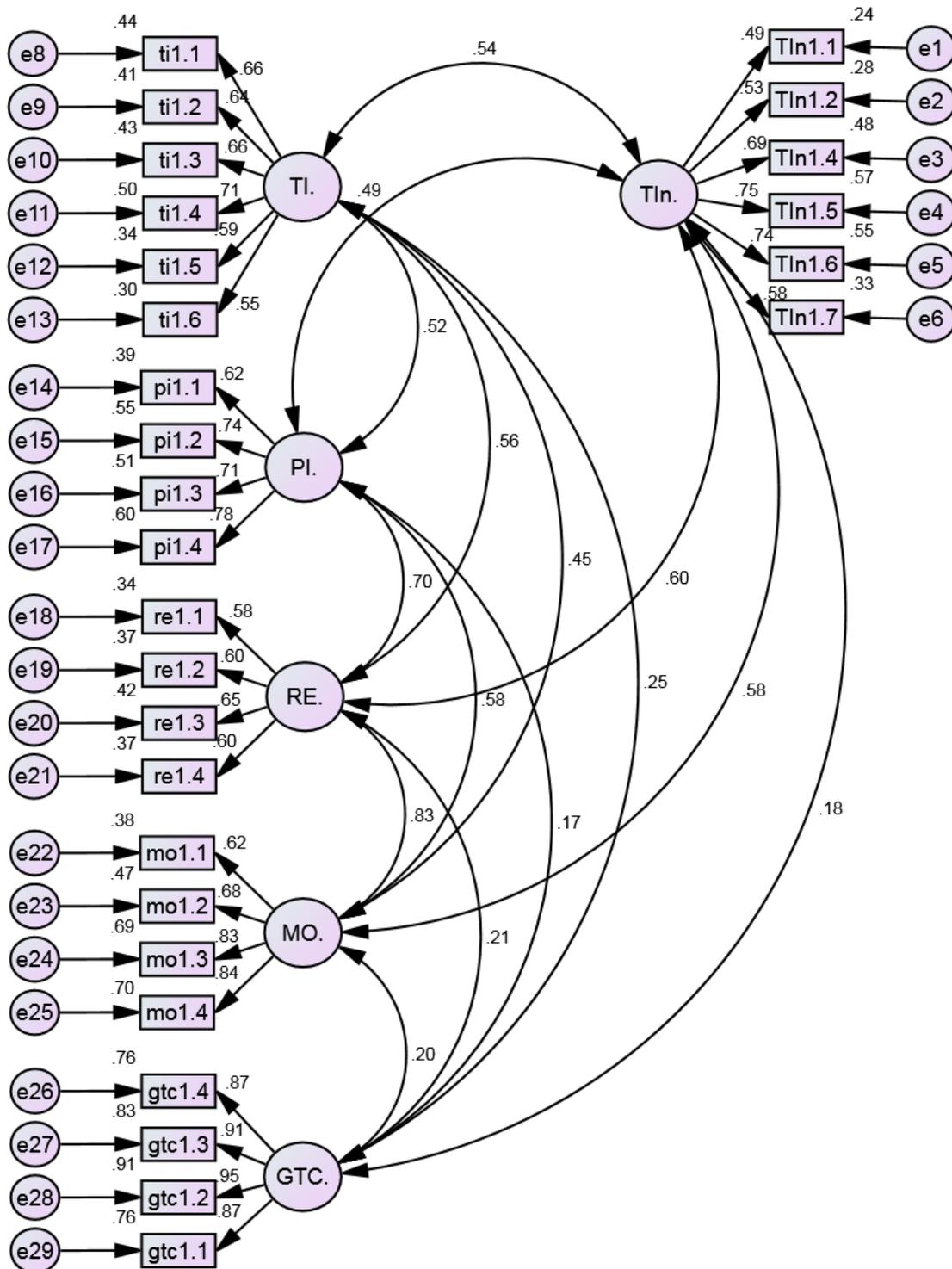
Appendix A

Figure 1. The Professional Practice and Inquiry (PPI) course structure



Appendix B

Figure 2. Standardised Estimates for the 6 factors, 29 item Professional Practice and Inquiry



(PPI) development of teacher identity and reflective practices Inventory.

Note: e = error

Appendix C

Table 1. Measurement Model Standardised Factor Loadings.

Item	TI	TIn	GTC	PI	RE	MO
1 I am aware of my teaching beliefs.	0.66					
2 I have developed my professional identity as a teacher.	0.64					
3 I have a clear idea of the type of teacher I want to become.	0.66					
4 I understand my personal purpose regarding teaching.	0.71					
5 I can define the outcomes I want to impart onto my students.	0.59					
6 I understand my personal role as an educator.	0.55					
7 When reflecting on my teaching, I have a question(s) in mind.		0.49				
8 When reflecting on my teaching, I think of classroom experiences to support my stand.		0.53				
9 When reflecting on my teaching, I will analyse my experiences.		0.69				
10 When reflecting on my teaching, I will think about how to make changes in practice.		0.75				
11 When reflecting on my teaching, I will think about ways to improve my teaching.		0.74				
12 When reflecting on my teaching, I can make connections between my past and present experiences.		0.58				
13 I am aware of the Graduand Teacher Competencies.			0.87			
14 I understand the requirements for the Graduand Teacher Competencies.			0.95			
15 I can see how the Graduand Teacher Competencies are interwoven in NIE's Teacher Education programme.			0.91			
16 I can present evidences for each of my Graduand Teacher Competencies.			0.87			
17 I think about the things I need to do for my teaching before starting on it.					0.62	
18 I set specific goals for my students' improvements before I plan for my teaching.					0.74	
19 I make a plan of how I will go about my teaching.					0.71	
20 I set specific goals for my professional development before I plan for my teaching.					0.78	
21 I think about what I really need to do before I begin to teach.						0.58
22 I review my existing resources before attempting new teaching strategies.						0.61
23 I stop once in a while and review what I have done for my teaching.						0.65
24 I go through what I have learned to prepare for teaching.						0.61
25 Reviewing my past work allows me to see my progress as a teacher.						0.62
26 I ask myself every now and then if I am doing things correctly as a teacher.						0.68
27 I periodically assess my knowledge of subject content for my teaching.						0.83
28 I pause regularly to see if I am on track for my teaching.						0.84

$\chi^2 = 768.74$

$df = 335$

$TLI = .92$

$CFI = .93$

$RMSEA = 0.05$

Appendix D

Table 2. Means, Standard Deviations, Cronbach alpha, Paired-Sample t Values of TI, TIn, GTC, PI, RE and MO for PGDE July 2014 intake (n = 479) at T1 and T2.

Measures	No. of items	Paired Sample Statistics				<i>Cronbach alpha coefficient</i>	Paired Samples Test				
		T2		T1			Paired Differences		<i>t</i>	<i>df</i>	Cohen's <i>d</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
1 Awareness of Teacher Identity (TI)	6	4.10	0.55	3.75	0.47	0.80	0.35	0.65	11.90**	478	0.54
2 Teacher Inquirer (TIn)	6	4.19	0.48	4.08	0.41	0.79	0.13	0.52	5.45**	478	0.20
3 Graduand Teacher Competencies (GTC)	4	3.88	0.55	2.91	0.81	0.95	0.97	0.93	22.80**	478	1.04
4 Strategy: Planning (PI)	4	4.14	0.48	4.00	0.48	0.80	0.13	0.62	4.69**	478	0.21
5 Strategy: Reviewing (RE)	4	4.08	0.47	3.90	0.46	0.70	0.17	0.59	6.48**	478	0.30
6 Strategy: Monitoring (MO)	4	4.12	0.46	3.97	0.48	0.82	0.15	0.58	5.65**	478	0.26

Note: ** $p < .001$

Appendix E

Table 3. Zero-order correlations at T1.

Variable	1	2	3	4	5	6
1 Awareness of Teacher Identity (TI)	-					
2 Teacher Inquirer (TIn)	.445**	-				
3 Graduated Teacher Competencies (GTC)	.224**	.179**	-			
4 Strategy: Planning (PI)	.422**	.406**	.153**	-		
5 Strategy: Reviewing (RE)	.428**	.475**	.184**	.540**	-	
6 Strategy: Monitoring (MO)	.394**	.527**	.172**	.514**	.645**	-

Note: ** $p < .001$

Appendix F

Table 4. Zero-order correlations at T2.

Variable	1	2	3	4	5	6
1 Awareness of Teacher Identity (TI)	-					
2 Teacher Inquirer (TIn)	.584**	-				
3 Graduated Teacher Competencies (GTC)	.431**	.461**	-			
4 Strategy: Planning (PI)	.515**	.673**	.504**	-		
5 Strategy: Reviewing (RE)	.490**	.655**	.493**	.772**	-	
6 Strategy: Monitoring (MO)	.526**	.698**	.501**	.735**	.755**	-

Note: ** $p < .001$