

Developing Theory-Practice Understanding Through Online Discourse Among Pre-Service Teachers

Carol Chan, Kennedy Chan, and Ka Lok Cheng
ckkchan@hku.hk, kennedyckh@hku.hk, chengkla@hku.hk
Faculty of Education, The University of Hong Kong

Abstract: This study examined how pre-service teachers developed an integrated theory-practice understanding through online discourses in the context of a teacher education course. Twenty pre-service teachers from a university-based course “Educational Inquiry” that included a component of school experience participated in the study. It included students engaging in online discussion to help them reflect on their school experience and to collaborate with their peers in linking theory and practice. Through an analysis of their online discourses, we identified a range of reflective and collaborative strategies that the participants used to deepen their understanding and extend their learning space. We also examined the students’ discourse through the lens of theory-practice dialectics to show how pre-service teachers practicalize theories and theorize practical experience. We also discussed the implications of designing online discussion and the use of strategies to scaffold pre-service teacher learning in theory-practice integration.

Keywords: CSCL, online discussion, theory-practice dialectics, pre-service teacher education

Introduction

It is important to conceptualize, integrate, and examine the relationship between theory and practice in designing learning in teacher education (Korthagan & Kessels, 1999; Zeichner, 2010). Traditionally, the weak links between university courses and field experience may have discouraged a closer examination of this relationship. An important notion of merging theory and practice considers learning as developing reflective thinking and practice. From this perspective, pre-service teachers need to reflect on their own experience, and their observations in the field, in light of principles of why one does what (Loughran, 2002). Different approaches have been developed to make meaningful connections between university and classroom experience, and to engage pre-service teachers to examine their personal theories of teaching and learning (Orland-Barak & Yinnon, 2007). The relationship between theory and practice has also been examined in terms of practicalizing theoretical knowledge and theorizing practical experience (Cheng, Tang & Cheng, 2012; Tsui, 2009). This postulation focuses on the dialectics of adapting strategies to contexts in relation to theories, and the development of deeper meanings and personal theories based on practical experience.

Contemporary theories from the learning sciences highlight how learning emerges through social interaction (Sawyer, 2014). Groups of learners can come together to articulate, reflect, and grapple with ideas to develop new understanding. Research in the learning sciences and teacher learning has emphasized communities of practice (Fishman, Davis & Chan, 2014) for practice-based teaching and how technology-enhanced learning can support teacher education. Studies in knowledge building using Knowledge Forum have shown how collective online discourse can help pre-service teachers develop more sophisticated conceptions of teaching (Hong, 2011). There is now increased interest in online discussion in higher education and teacher education (Szabo & Schwartz, 2011). However, relatively little attention has been given to how it can support pre-service teachers making salient observations and reasoned interpretation of their observations by linking to the theory and principles of teaching and learning (van Es & Sherin, 2002). This reflection is central in teacher education (Orland-Barak, 2007) and can be enhanced by shifting from individual reflection to collective reflection. In this sense, online reflective discourse can help illuminate students’ learning experience, which is not easily captured when they work in different field settings. Accordingly, this study examined teacher learning in the context of a Postgraduate Diploma of Education (PGDE) program, which includes a School Experience component. Specifically, we explored how pre-service teachers engage in theory-practice connections and how online discussions could support their co-construction of ideas and enhance theory-practice understanding.

Results and analyses

Data were drawn from 20 pre-service teachers’ online writing and discussion in a required course “Educational Inquiry” with a component called School Experience conducted over the year. Students in Group A and B wrote

an average of 18.3 notes and 15.5 notes, and viewed the discussions 121.2 and 41.3 times respectively. Both groups went beyond the required number of notes in the assignments. The students' writings were analyzed in terms of how they connected theory and practice as they worked collaboratively in making sense of their experience during their time at the schools.

Reflective and collaborative strategies for theory-practice connections

We identified different kinds of responses that illustrated how pre-service teachers reflected on their experience and connected theory with practice in university and school settings (Table 1).

Table 1: Reflective strategies linking theory and practice

Categories	Examples
Describe observation with no reference to principles	The school set a strict rule about sleeping in class. When a teacher found that a student fell asleep, other students reminded the student ...and asked the teacher to punish him...[WT]
Name teaching incidents in relation to principles	In my class, <i>formative assessment</i> was carried out in classroom exercises, such as 'write your answers on the whiteboard and share with the class.' [KA]
Interpret teaching incidents linking to principles	From observing Mr. C's class, I noticed he asked very close-ended questions. In comparison, Ms. C asked open-ended questions. Mr. C's students seemed less motivated and others more motivated. This seems to be same as ...readings [RH].
Consider principles in different contexts	I observed two classes and I saw the same teacher using intrinsic motivation strategies in different ways. The two classes had different reactions. [WT]
Note the gaps and tensions between expectation and reality	My mentor said that her class loved the traditional didactic way, rather than the constructivist approach. What should we do as student teachers...try out the constructivist approach or use the didactic approach to satisfy our students? [KW]
Connect and interpret observations with theoretical notions	One of the lessons that fascinates me is the school's 'Editorial Reading,' which makes use of newspaper articles... Ss need to pose two questions on current news events to develop their analytic skills. I think these activities illustrate qualitative learning. They had to construct their own understanding of the world, formulate their own opinion. The teachers were there to facilitate and to scaffold students' learning. [NW]
Restructure/deepen understanding emerging from theory-practice tensions and informing future actions	I think the biggest theory-practice gap was that we are encouraged to use students' prior knowledge. However, in this case, their prior knowledge was misused... They should use evidence from the lab not from their pre-conceptions of what a plant looks like... I see that constructivism's prior knowledge can be good and bad... I encouraged students to draw/write what they saw. If possible, I would talk to them about collecting evidence and how to utilize evidence... Scientists cannot rely on preconceptions, but on evidence. [TC]

These identified strategies ranged from just describing what they saw, to making interpretations, to working on the dialectics for restructuring knowledge; and they reflect students' attempts to practicalize theory and theorize practice. Some were using just naming, and others linking and interpreting the experience in relation to principles as they try to make sense of what they learnt. In the last example, the responses suggested how the student's reflection helped him to develop a richer understanding of the role of prior knowledge in constructivism, as he theorized his practice, showing how theory-practice gaps provide new meanings to enrich knowledge and practice. In the following, students writing were analyzed to identify collaborative strategies in online discussion that support them to make meanings (Table 2)

Table 2: Collaborative discourse strategies in online discussion

Strategies	Examples
Build on and elaborate	I agree with you about setting criteria.. Besides, I have 2 more examples to add [TY].
Enrichment of experience and identification of strategy	Thanks for sharing your experience in your school and it really benefits us reading your note. I particularly like two points...one is the strategy...the teacher used... [HW]
Share similar experience	<i>Something very similar happened in my class.</i> When you talked about this, I thought of the experience before. [NW]
Coordinate and synthesize	What I am thinking is in line with what I read from NW and FA. Like the two of you, I also think that. [BH]
Asking questions and brainstorming responses	What do you think? Do you think the school's approach was the best choice? Or do you think there could be a better approach? [NW]
Springboard for questions	NW, I think your mentor did a great job using some already understood concepts for students to address their misconceptions. <i>But I am curious how your teacher found out the misconception or whether he just assumed that</i> [CH]

Providing explanation and elaboration	I think it's very important that students (and everyone for that matter) understands the differences between ad hominem and ad rem arguments. Ad Hominem is...Ad Rem means... If students are making valid arguments (ad rem) let them continue. [RS]
Diversity, contrasts, and different contexts	To contrast the discipline in WT's school and mine, my school does not focus on discipline, but teaching is still highly effective. I think this is a question of school culture. Maybe firm discipline is appropriate for some, but not others. This is a big factor that we as student-teachers need to consider [RS]...

We identified different patterns of collaborative strategies that included elaborating and building on others' responses, asking questions, providing explanations, and extending the space of learning through considering others' experience and examples. Reflection on their school experience put in a collaborative space is now enhanced with students supporting others using collaborative discourse strategies.

Productive discourse and theory-practice dialectics

We also examined how students developed deeper ideas through building on others' posts. We emphasized co-construction of ideas for idea improvement and also from the lens of theory-practice dialectics (Tsui, 2009).

Excerpt 1: Practicalize theoretical ideas

HW: My mentor said that her class likes the traditional didactic way, rather than the constructivist approach. What should we do, try out the constructivist approach or keep the didactic approach?

HY: I think students like the didactic approach because they are used to it. Another possible reason is that the didactic approach allows them to be withdrawn, but a constructivist approach asks them to be engaged in learning. I think the teacher has to find out more about what students like and use their interests to design the lessons. If they find constructivist learning fun, they may start to enjoy it.

The exchange suggests a common tension between the theories and demands of a practice situation. HY's response did not just provide the answers, but analyzed the problems and provided alternatives and her attention was shifting to student learning. As the discourse continues later, another student raised another problem related to student ability ("my mentor said constructivism cannot work for low achievers?") HY responded by elaborating her understanding and providing practical strategies of how constructivism may work in school contexts ("weaker ones may be able to do that...perhaps it is the teacher's questioning that influences how constructivist learning is practical or not?") In dealing with these issues, they were working together to practicalize theories learnt in university classes.

Excerpt 2: Theorizing practical experience

WT: When the teacher tried to use formative assessment asking Ss questions to check their understanding, often she could not ask all students... But answers by the individual students may not show the picture of the whole class. Sometimes Ms. C gave the answers soon when students did the worksheets? Students knew she would give them the answers.

NW: Hi WT, I agree with your point that questioning may not be very effective formatively to assess all students. *Something similar happened to classes I have observed...* there were either no responses or always the same ones who answered the questions... Another way to get a better chance of the whole class' learning is to use other forms of formative assessment, such as in-class quizzes or worksheets, which require all students to participate.

TC: *That is a great question about formative assessment. I think your concern is why we need to use different types of formative assessment not just questioning/worksheets. Asking students to work on the board, voting, traffic light, and mini-whiteboard may provide a clearer picture of what the class thinks. I would also like to put scaffolding into practice..My mentor encouraged me to use guiding questions to find out why*

students have questions/problems in the first place...I think it's a great way to engage students in *meaningful learning*, rather than just giving answers for *rote learning*.

This discussion started with a practical problem where the teacher did not use questioning effectively to assess students. NW shared her similar experience and suggested other practical solutions. TC deepened this discourse by turning the practical problem of classroom questioning into an exploration of the nature of formative assessment by asking 'why' different types of formative assessment were used. They were not just discussing what to do, but why to do certain thing. TC continued to conceptualize by linking to theories he learnt on 'scaffolding' and examining the crux of the problem of assessment relating to meaningful and rote learning. The practical question on classroom questioning was deepened through collaborative discussion using experience to elucidate theory as they explained the nature of formative assessment for meaningful learning.

Implications

This paper reports on the findings of an ongoing study that examined how pre-service teachers attempted to make theory-practice connections for professional learning through an analysis of their online discourse. The analysis not only illuminated different patterns of reflective and collaborative strategies, but examined productive discussion from the perspective of theory-practice dialectics. For instance, they sought different ways to practicalize principles, used theory to inform observation, and adapted theory to particular contexts. They also theorized their experience, used their experience to elucidate, and enriched theory to inform their action. The online learning environment made it possible for the pre-service teachers to make their questions and ideas explicit. It also facilitated student peers to provide support and resources to scaffold thinking by asking questions, providing explanations, allowing tensions to surface, and collaboratively grappling with issues. Theoretically, the study extends current work on the reflection of theory-practice integration in teacher education by shifting from individual to *collective* reflection. It also enriches research on CSCL/online discourse by examining theory-practice dialectics and developing professional learning for pre-service teachers. From a design perspective, it is important to investigate how to design such environments to provide opportunities for novice teachers to interpret and test theories, which allow for the surfacing and revision of errors collectively. The identified reflective and collaborative strategies could provide useful scaffolds and pointers for the development of a scheme to help pre-service teachers reflect on and discuss the theory-practice connection. Issues including the developmental trajectory of productive discourse and how pre-service teachers change over time through their participation in online discourse need to be further investigated.

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