Development of Professional Identity and Related Metacognitive Thinking Procedures of English Language Teachers Through Spontaneous Collaboration for Pedagogical Problem-Solving

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Abstract
This research explores potential benefits of the spontaneous collaboration of a small group of teachers regarding their professional identity (PI) and related metacognitive thinking procedures. The researcher conceptualizes the co-operation of PI and metacognition via interactive pedagogical problem-solving and presents spontaneous collaboration processes of a beginning teacher (BT) and an experienced teacher (ET) of English. Based on the qualitative approach, it was revealed that the BT often referred to the ET’s meanings constituting her PI, but through pedagogic experimentations and dialogic meaning negotiations, BT gradually improved her meanings/PI and related metacognitive thinking procedures as identified BT becoming more self-critical and pursuing professionalism. The ET reshaped her meanings/PI through constant monitoring and regulations, stimulated by the BT, and elaborated these and metacognitive thinking procedures by focusing on what to improve. Implications of the findings are discussed in relation to professional development.

Keywords
spontaneous collaboration, professional identity, metacognition, meaning negotiation, problem-solving

Teacher interaction contributes to their professional growth. Working together, teachers share expertise and move beyond individual limitations (Hargreaves, 1994). To obtain these benefits, many administrative projects have been performed to facilitate teacher collaboration (Datnow, 2011). In this form, collaboration processes are externally regulated and teachers are often required to produce predictable outcomes (Hargreaves, 1994). Thus, teachers may experience the limited effect of professional development with controlled motivation (Deci & Ryan, 2015). Such a collaboration also presupposes strong leadership (Sutton & Shouse, 2016) or the use of experts (Johnson & Golombek, 2020; Poulos et al., 2014), which might be costly and makes teachers perceive collaboration as evaluation (Ladyshewsky, 2017). The ultimate goal of contrived collegiality is thus to evolve itself into a more flexible and developmental form of interaction (Datnow, 2011; Sutton & Shouse, 2016).

Teachers can collaborate spontaneously and flexibly in a collaborative culture. Though facilitation of this form of collaboration requires a long-term and ecological approach (Sutton & Shouse, 2016), it has several benefits for sustainable professional development (Barfield, 2016; Datnow, 2011; Johnson & Golombek, 2020); teachers form purposes and tasks themselves, feel a sense of productivity, enjoy professional learning and produce unpredictable outcomes (Hargreaves, 1994). As it is founded on teacher deliberation, it is ethical and professional (Hargreaves & Dawe, 1990) and improves their intrinsic motivation (Ryan & Deci, 2017). When such collaboration takes place in a small group, these benefits may operate effectively with increased flexibility in group organization and maintenance.

Despite these, studies of teacher collaboration have focused on revealing the effects of, and the methods for, administratively organized teacher collaboration (Datnow, 2011). Those studies address the influence of collaboration on the development of teacher professionalism or professional identity (PI) (Crafton & Kaiser, 2011; Golombek & Johnson, 2017; Johnson & Golombek, 2020; Prytula & Weiman, 2012; Yuan et al., 2018) but without defining what PI or its development means and without describing
related thinking processes teachers may experience during collaboration.

Thus, in the current study, the researcher (a) conceptualizes the operation of teacher PI, especially along with related metacognitive thinking procedures via interactive pedagogical problem-solving. Then, in relation to this conceptualization, (b) spontaneous collaboration processes of two Korean English language teachers are presented; despite several benefits for professional growth, this unit of daily collaboration has been neglected in the studies of teacher collaboration (Fulton & Britton, 2011; Pouloula et al., 2014; Vangrieken et al., 2015). Based on the conceptualisations and the findings, the researcher (c) suggests implications to advance teachers’ spontaneous collaboration for professional growth.

**Operation of Teacher PI and Related Metacognitive Thinking Procedures Over Pedagogical Problem-Solving Processes**

**Professional Identity**

PI is the self-perception of a teacher within his or her profession (Knowles, 1992; Neary, 2014) and includes his or her perception of how others define him or her in their relational context (Amin, 1997; Danielewicz, 2001; Golombek & Jordan, 2005; Jenkins, 1996). Based on this perception, teachers are motivated to interact with others through cognitive, affective and behavioral responses (Burke & Stets, 2009), act in identity-congruent ways (Oyserman et al., 2017) and verify their identities (Burke & Stets, 2009). This perception comprises different meanings (Burke, 2006) or content (Galligher et al., 2017), constructed by the teacher’s experiences and social, cultural, historical and political discourses (Galligher et al., 2017; Oyserman et al., 2017; Vaghese et al., 2005). The meanings/content are a cognitive domain including knowledge of the world, person, task, and strategies and considerations of what to do, what to pursue, and what is expected of oneself (Burke & Stets, 2009; Oyserman et al., 2012); thus, they operate as the theories of action (Danielewicz, 2001). Therefore, identity development involves modifications of its meanings (Galligher et al., 2017).

As a teacher is simultaneously bound to different discourse communities, his or her PI involves different identities, such as employee identity, learner identity, person identity, national identity, researcher identity, and teacher identity, and each comprises different meanings (in)compatible with each other (Bucholtz & Hall, 2004; Burke & Stets, 2009; Han, 2017; Nagatomo, 2012). Thus, depending on the situations, these identities and their meanings compete with each other to gain priority, concurrently interacting with external meanings (Burke, 2006; Oyserman et al., 2017), as there is only one body to act (Burke & Stets, 2009). These dynamic meaning comparisons and negotiations are metacognitive activities, including thinking about thinking (Flavell, 1979), occurring consciously or unconsciously over a teacher’s pedagogical problem-solving processes (Koriat, 2000; Oyserman et al., 2012) alongside the activation of their PI.

**Transformation of PI and Related Metacognitive Thinking Procedures**

Metacognition is a person’s awareness and ability in planning, performing, monitoring, and evaluating learning or problem-solving processes (Jafarzadeh, 2014; Pretz et al., 2003). It is personal reflection and management as a learner of one’s own knowledge and competency or emotions (Davidson et al., 1994; Fernandez-Duque et al., 2000), involving comparisons (monitoring) and negotiations (regulations) between internal meanings or between internal and external meanings (Davidson & Sternberg, 1998).

To define their problems, teachers compare their internal and external meanings (Davidson & Sternberg, 1998). Then they interpret which identities/meanings constituting their PI can be prioritized in their context, pursuing identity-congruent actions (identity realization) (Oyserman, 2015; Oyserman et al., 2017). Thus, if they judge that their meaning that values professional practice can be performed, they will feel that the situation is meaningful; but if they judge that it cannot, they may recognize the situation as irrelevant (Oyserman et al., 2012). They also expect their actions and cognitive and affective responses to be reconciled with external meanings (Ashforth et al., 2008; Burke, 2006), because when people perceive that others recognize them in a manner consistent with their self-perceptions, they feel positive emotions (identity verification) (Burke & Stets, 2009; Stets & Burke, 2014). Thus, if their meaning that values professional practice is prioritized, then in order to be recognized as professional, teachers may endeavor to solve their pedagogical problems and apply metacognition because using metacognition contributes to successful problem-solving (Hiver & Whitehead, 2018; McCormick et al., 2013). However, when judging that their identity realization and verification are not easy, teachers may feel frustrated (Han, 2016); some may regulate their emotions and set negotiated aims and others may change their actions (Han, 2017) or internal meanings (Burke & Stets, 2009) to accord with external meanings. Then, for strategy design, teachers will select their internal meanings related to the problems through meaning comparisons or retrievals or associations (Robertson, 2017; Sternberg & Sternberg, 2017). After implementation, they may modify their strategy and related meanings, learning from their findings (Hiver & Whitehead, 2018; Jonassen, 1997). In this way, through metacognitive problem-solving processes, teachers’ internal meanings change, and thus their PI transforms, and their metacognition develops (Sciuchetti et al., 2018; Wiele et al., 2017).

Thus, development of teacher expertise means that (a) a teacher’s PI involves various pedagogic meanings containing those that highly regard professional practice, (b) the
teacher context-sensitively prioritizes and reshapes these meanings through pedagogical problem-solving, and (c) the teacher use related metacognitive thinking procedures including comparisons (monitoring) and negotiations (regulations) of different meanings for balanced identity realization and verification; see Figure 1.

**Development of PI and Related Metacognitive Thinking Procedures Through Spontaneous Collaboration for Pedagogical Problem-Solving**

**Development of PI and Related Metacognitive Thinking Procedures Through Collaboration**

Though teachers can develop their professionalism through individual reflections (Golombek & Johnson, 2017), this may not be easy due to the high level of criticality and metacognition required (Orgovanyi-Gajdos, 2016). Thus, interactive problem-solving, or reflection with others, can be a supportive method, especially for developing teacher PI (Siry & Lara, 2012).

Interacting with others, teachers can share different meanings. They can define their problems from different perspectives and form diverse strategies (Cheng & Ko, 2009). Some shared meanings can constitute each other’s identity through communications and experimentations (Danielewicz, 2001). Conflicting meanings can lead them to confront their taken-for-granted meanings (Keestra, 2017). They can co-evaluate strategy implementations, stimulate criticality in each other (Prytula, 2012) via reflective dialogues (Cheng & Ko, 2009) and consider various social and situational discourses and the relationships between these and themselves, which enables them to find comprehensive rationales to modify...

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**Figure 1.** Professional identity and metacognitive meaning comparisons and negotiations between internal and external meanings.

*Note.* Dotted line: metacognitive meaning comparison and negotiation, different sizes of identities reveal their different activation/prioritization. PI = professional identity, M = meaning constituting identity.
their strategies, meanings and identities (Danielewicz, 2001). Moreover, as these processes are mediated through verbalisation (Bucholtz & Hall, 2004; Varghese et al., 2005), metacognitive monitoring and regulations become more explicit and manageable. In this way, teachers experience a higher level of reflection, reflection on how one reflects (Von Wright, 1992), operating as a third metacognitive cognition to each other.

In sum, through multiple meaning comparisons and negotiations over shared pedagogical problem-solving, teachers develop their PI and related metacognitive thinking procedures (Keestra, 2017; Prytula, 2012) in a personal, social, and dialectic way.

**Development of PI and Related Metacognitive Thinking Procedures of a Small Group of Teachers in Spontaneous Collaboration**

When two or three teachers teaching the same or the same grade of students in the same school collaborate spontaneously, their collaboration may have the following attributes in relation to their PI and metacognitive development, in comparison with other forms of teacher collaborations.

**Distinctiveness and responsiveness.** Their soft bond can have a distinctiveness/autonomy from their institution, as their decisions may not be completely defined by external forces and they can maintain individualities. It also involves a responsiveness/connection, as they should produce actions technically reconciled with institutional sustainability and accountability or for social and situational acceptability (Bucholtz & Hall, 2004; Orton & Weick, 1990; Weick, 1976).

**Flexible meaning negotiation.** As they do not aim to create a common enterprise, their interaction is open-ended (Danielewicz, 2001), which is different from that of a large community (Wenger, 1998). Individuals can determine the degree and direction of their engagements, differentiation and identification of meanings and energy investment for aligned actions (Wenger, 1998); when meanings are negotiable, the teachers may collaborate conjunctly, similar to that of co-teaching (Darnell, 2017), but when they are not, they may exchange small talk. They can differently define problems, set goals, design strategies and evaluate and learn from different aspects of shared experiences. With this flexibility, teachers can enjoy interaction (Deci & Ryan, 2015), exercise creativity while feeling secure (Prytula, 2012) and dissimilarly develop their PI and related thinking procedures.

**Comprehensive and evolutionary professional development.** Individually or interactively, they can try meaning negotiations with situation-specific ideas, experiment with these ideas and produce situated knowledge; this is effective teacher education (Benson, 2010) and reflection on reflection (Von Wright, 1992). These dialogic metacognitive activities that occur on a daily basis (Rock & Schwartz, 2006) are a feasible and primary form of collaboration (Doppenberg et al., 2012). Through this, teachers can experience in-depth conversations (Poulos et al., 2014) and meaning internalisations (Golombek & Johnson, 2017) and gradually change their PI and metacognitive thinking procedures.

**Mutual development of professionalism.** While mentoring requires an experienced mentor to give advice to the mentee (Ladyshewsky, 2017), and peer coaching requires a coach’s questioning skills and the coachee’s professional growth (Orgovanyi-Gajdos, 2016), any two teachers can develop together through spontaneous collaboration. When experienced teachers (ETs) collaborate, they share plentiful ideas (Keestra, 2017). When beginning teachers (BTs) interact, they may test innovative methods (Orgovanyi-Gajdos, 2016). When an ET and a BT collaborate, the BT can refer to the ET’s meanings and the ET is stimulated to revisit his or her old repertoires (Prytula, 2012).

Based on this conceptualization of the operation and development of PI and related metacognitive thinking procedures of a small group of teachers in spontaneous collaboration, the current study explores the collaboration processes of an ET and a BT of English for their pedagogical problem-solving.

**Research Design**

**Participants and Settings**

The researcher first met Su-mi and Eun-ju while investigating teachers’ pedagogical problem-solving processes, as they agreed via email to participate in the research in response to the researcher’s request for research participation. In the data analysis process, realizing that many of their cognitive, emotional and behavioral responses and their decision making were based on several shared meaning negotiations between them, the researcher decided to focus on their interaction for a new study; this new aim and direction were explained to them.

At the time of the research, Su-mi was in her early thirties and Eun-ju in her mid-thirties; both were single women. Su-mi majored in English literature and had one year of teaching experience in a middle school. Eun-ju majored in English education and had 10 years of teaching experience in secondary schools. They were teaching the same students in a state high school located in a suburban area of Busan, South Korea, on which there was not any administrative intention (Yin, 2018).

Their second-year students totalled around 250 and constituted eight mixed-gender and mixed-level classes. They taught English for 16 hr each week. In our first meeting, they reported that many of their students suffered from lethargy.
due to the state-given privilege that guaranteed a separate offer of university entrance for the suburban students. They initially attributed their students’ low participation in classes to this reason. Nevertheless, Su-mi could not accept her students’ cynical attitudes, and Eun-ju wanted to overcome her frustration with students who were sleeping in her class and her students’ low achievement. They thus frequently communicated to improve their problematic situations and recognized that the problem was based on a variety of factors.

Data Gathering

The current study aimed to answer “how” and “why” two English language teachers used and reshaped their PI and related metacognitive thinking procedures through spontaneous collaboration for pedagogical problem-solving. The researcher tried to address a case, similar versions of which could be observed in other teachers, but that had not been systematically addressed as a research focus in previous studies. While multiple-case designs can be advantageous in gaining more analytic benefits (Yin, 2018), the current single case study of a natural and effective unit of teacher interaction enabled the researcher to deeply explore the teachers' cognition, emotions, actions, and meaning negotiations that led to their PI and metacognition changes and to critically test the prevailing research, which focusses on the effectiveness of large teacher communities or contrived collegiality (for a similar rationale, see Gross et al., 1971).

Development of PI can be identified through teachers’ daily cognitions, emotions and actions (Burke, 2006; Han, 2016, 2017), and that of related metacognition can be grasped through the investigation of teachers’ stories about their problem-solving experiences including their cognitive, emotional, and behavioral responses (Akturk & Sahin, 2011; Tobias & Everson, 2002). Thus, the researcher tried to collect a variety of narrative data. This contributed to increased reliability of the evidence (Yin, 2018). To conduct the research in an ethical way, the forms and methods of data gathering were determined through negotiations with the participants. Eun-ju kept a short diary, while Su-mi wrote memos and made a summary of her experience; these narratives included their interactive teaching processes of 6 months. In order to minimize poor recall and avoid excessively reflected ideas (Yin, 2018), and to reveal the phenomenon as it is (van Manen, 1990), Eun-ju was required to record things as immediately as possible when issues arose. Her regularly produced narratives, with their transformative power, seem to have helped her reflect on her PI and its meanings (Danielewicz, 2001). Both teachers recorded three of their own classes—existing classes, pilot classes, and target classes—for self- and cross-reflections. Their summarized reviews of the recordings were included in the data. In this way, the researcher triangulated the data and increased the construct validity (Patton, 2015; Yin, 2018).

In accordance with the participants’ suggestions, a focus group interview was performed 6 months after the research in the form of casual conversation among Su-mi, Eun-ju and the researcher; the researcher did not agree to, nor refute, the teachers’ ideas during the meeting so as not to undermine their revealing of the truth. The meeting was conducted in a café and lasted an hr. The researcher provided the teachers with semi-structured questions about (un)successful aspects of their experiences, recent practices and ideas about desirable pedagogies. The researcher used “how” questions to draw out in-depth both the “how” and “why” of the phenomenon (Yin, 2018); how their soft bond operated in relation to their PI and metacognitive thinking procedures, and how their reflective practice developed after collaboration. As the focus group interview aimed to mainly measure the influence of the teachers’ collaboration experience on their current practice and the continuity of similar experiences, the conversation focused on the latter topic. They talked in Korean for their convenience. The conversation was recorded with their agreement and transcribed into English by the researcher.

Data Analysis

Data analysis was initiated with data gathering (Merriam, 1998; Stake, 1995). On the first review of the teachers’ cognitions, emotions and actions, the researcher tried to give open-ended answers to the original research question (Yin, 2018). The researcher then arranged all of the data in the order of general problem-solving, as per Pretz et al.’s (2003) seven stages. Repeatedly reading the transcription in order to identify differences between the events, and between the narratives within an event, and comparing one unit of information with another in a sequential way (Merriam, 1988, 1998) the researcher reduced these into four categories: (a) problems and objectives specification; (b) strategy development; (c) piloting and strategy modification; and (d) strategy implementation and meaning modification. The focus-group interview was analyzed to triangulate other data and reveal (e) the continuity of the teachers’ reflective practices after collaboration. The data was thus coded chronologically, including sequential topics (Yin, 2018).

Next, the researcher jotted down abbreviations and comments on the participants’ experiences in the margin of each narrative chunk and differentiated individual meanings and decisions and interactively negotiated outcomes. As what was said and what was done may not have been consistent, the researcher compared their narratives with their observed actions (Schoenfeld, 2011) in the video recordings and corroborated their stories (Danielewicz, 2001). In the reading that followed, the teachers’ meaning comparisons and negotiations were analyzed to answer: whether they pursued pedagogic improvement through metacognitive monitoring and regulations of cognitions, emotions and actions; whether they context-sensitively activated meanings and identities through metacognitive processes; whether the teachers’
meanings changed; and whether they became more critical. These formed the sub-categories for precisely coding most of the data content. In the next reading, the attributes of the teachers’ bond were construed and compared with related conceptualisations.

In these ways, the researcher gradually deepened the interpretation of the data and created categories and themes to interpret and discuss (see Table 1). The data analysis process was reviewed by the researcher using deductive and inductive modes of thinking through the examination of whether the categories involved relevant data content and if the research question was answered to the fullest. The researcher again tried to enhance construct validity by letting the participants review the draft of data analysis (Merriam, 1988, 1998; Yin, 2018).

Reality is “not a single, fixed, objective phenomenon,” but “holistic, multidimensional, and ever-changing,” so the findings of the current research cannot be easily replicated even when conducted with the same tools and similar informants (Merriam, 1988, p. 167). The researcher’s data analysis was thus an endeavor to disclose what was true to the participants in relation to the research topic; this made the research more internally valid (Merriam, 1988). Nonetheless, the researcher expects that this study suggests an applicable method with which to help researchers investigate different forms of teacher bonds and disclose various rationales for professional growth.

Development of PI and Related Metacognitive Thinking Procedures of Two English Language Teachers Through Spontaneous Collaboration for Problem-Solving

In the Phase of Problem and Objective Specification

Based on the identification of meanings, Su-mi and Eun-ju video-recorded their lessons to define problems and then shared the recordings and self-reflections. Analyzing their motions, speech, activities, and the learner responses, Eun-ju found that she did not move around the classroom and give her students sufficient time to prepare answers to her questions and that YouTube took many students’ attention. Eun-ju thought that Su-mi controlled the student learning pace well. Su-mi’s analysis was not relatively detailed. She thought that she did not give her students organized explanations of language structures as compared to Eun-ju. In this way, their analyses were focused on drawing out their own weaknesses and the other’s strengths. This metacognitive monitoring continued over the processes toward solutions.

Su-mi: I suggested learning objectives to the students to keep their attention until the end of the lesson, [leading their participation in] the objective-related activities. But it was not easy to lead them to concentrate on every step of the lesson. Especially, I’m less competent at grammatical explanations than ET. She is logical and calm.

By monitoring their classes and interpreting the possibility of their identity-congruent practices (Oyserman, 2015; Oyserman et al., 2017) and identity verification (Burke & Stets, 2009), Su-mi and Eun-ju formed negotiated aims. That is, by trying to reconcile their pedagogic meanings that valued both the teacher-led grammar translation method (GTM) and learner-centredness with students’ expectations of test-preparation and the curriculum requirement for implementing the learner-centered communicative language teaching (CLT) approach (Ministry of Education, 2015; Ministry of Education, Science, and Technology, 2009), they planned to (a) develop methods and materials to increase student participation and (b) teach both communicative skills and language knowledge; these aims reveal the distinctiveness and responsiveness (Orton & Weick, 1990) of their tie. Eun-ju outlined the aims and Su-mi added her ideas. With their different micro-issues, each pursued different specific objectives and strategies.

In the Phase of Strategy Development

Considering the expectations of the students, parents, and school regarding high student achievement in the Korean scholastic aptitude test (KSAT), Su-mi and Eun-ju focused on teaching reading skills; the KSAT examines reading skills up to 65%. Both believed that Koreans regarded learning without grammar explanation as unlearning, while thinking that CLT was effective in enhancing student communicative skills and interest in learning as their national curriculum suggested. Based on these comprehensive understandings of individual, social and situational factors and their relationships (Daniewicz, 2001; Freeman & Freeman, 1994), they co-developed negotiated pedagogies; using group work for text translation, video material for grammar explanations, and PowerPoint material and work-sheets for vocabulary teaching.

Meeting at lunch times and between classes and talking about material development and activity sequencing, Su-mi and Eun-ju specified their strategy. Concerning word teaching, Eun-ju believed that teaching words within the context was meaningful, while Su-mi thought teaching them before reading could benefit student reading. However, this meaning gap stimulated ET to reshape her own meaning/cognition (Prytula, 2012), ready to transform her PI (Jenkins, 1996). Then “the other” was operating as a third metacognition.

Eun-ju: I let the students use the words within the contexts, after which they can practise to extend their uses. If I provide them with the word meanings [as Su-mi
| Phases and objectives specification | Ts | Individual meanings/cognitions, emotions, and actions | Reconciled meanings | Negotiated meanings/cognitions, emotions, and actions | Attributes of their bond |
|-----------------------------------|----|-----------------------------------------------------|---------------------|----------------------------------------------------|-------------------------|
| BT                                |    | Not giving the students structured explanations     | Video recording their classes and sharing analyses | Specifying the goals for pedagogic improvement: developing interactive teaching methods, increasing learner participation, and teaching language knowledge and skills | Autonomous problem definition representation of distinctiveness |
| ET                                |    | Not being competent in defining the problem         | Recognizing the limited pedagogic options with the KSAT, focusing on teaching reading skills | Designing new reading lessons with a cooperative text translation activity and supplementary materials | Goal settings with consideration of the requirements of the curriculum and learners: representation of responsiveness |
|                                  |    | Not moving around in the classroom                  | Valuing teaching reading with grammar explanations | Dividing roles to develop materials                 |                         |
|                                  |    | Not giving the students the time to answer          | Recognizing the value of CLT                        | ET's reflecting on her word teaching method, stimulated by BT |                         |
|                                  |    | Recognizing the effectiveness of YouTube           | Recognizing the need to modify the strategy through negotiations with learner responses, one's teaching competence, and the limitations of materials | Recognizing the need to change the way of group organizing, word teaching, and the length of the video material |                         |
|                                  |    | Being skilled in defining the problem              | Partially transforming her strategy for group organization, word teaching, and the length of the video material, influenced by the BT’s outcomes |                         |                         |
|                                  |    |                                                   | Reshaping her pedagogic meanings by observing enhanced classroom interaction, and sharing the outcomes with BT |                         |                         |
| Strategy development              | BT | Valuing teaching new words at the beginning of the lesson | Recognizing students’ different preferences for group work | Recognizing the irreconcilability between her personality and group work management | Autonomous learning from flexible meaning negotiations with the other |
|                                  |    | Developing video material for teaching language structure | Becoming self-critical | Recognizing the need to develop more various materials and pedagogic repertoires | Gradual development of metacognition with increased criticality and change of PI with reshaped pedagogic meanings |
|                                  | ET | Valuing teaching new words within the context       | Pursuing different pedagogic sources in daily life to better encourage learner participation | Creating a new strategy watching TV, inspired by BT |                         |
|                                  |    | Developing worksheets and PowerPoint materials      | Recognizing the effectiveness of letting students follow the teacher’s instructions for reading | Confirming her meaning of deductive word teaching through her current students' responses |                         |
| Pilot and strategy modification   | BT |                                            | Recognizing the effectiveness of summarizing the text at the end of a reading lesson | Forming an eclectic approach by negotiating her beliefs, her competence, other teachers' practices, and learner responses |                         |
|                                  |    |                                            | Recognizing the need for constant professional development | Recognizing and criticizing the difficulty of meaning changes in experienced teachers |                         |
|                                  | ET |                                            |                                                   |                         |                         |
| Strategy implementation and meaning modification | BT | Recognizing that different students need different support | Recognizing interaction with ET as a time for self-reflection | Recognizing the effectiveness of letting students follow the teacher's instructions for reading | Autonomous and constant reflections of various meanings and practical endeavors for pedagogic improvements |
|                                  |    | Focusing on what to improve                        | Learning several know-hows from ET                  | Recognizing the effectiveness of summarizing the text at the end of a reading lesson |                         |
|                                  |    |                                                    | Persuading her overcoming of cognitive and emotional challenges through communication with ET | Recognizing the need for constant professional development | Transformation of meanings through dialogic relations |
|                                  | ET | Recognizing BT as a motivator for her reflective practice | Recognizing several skills from BT                  |                         |                         |
|                                  |    | Having an analytical perspective on other teachers' practices | Having an analytical perspective on other teachers' practices |                         |                         |

Note: BT = Su-mi; ET = Eun-ju; KSAT = Korean scholastic aptitude test; CLT = communicative language teaching; PI = professional identity.
does], I think it would be necessary to lead them to grasp and memorise the meanings with the use of pictures or by meaning comparison activities or blank-filling activities.

They specified the strategy as follows, but they left to individual preferences, the selection of the content of YouTube material, ordering the activities, teaching new words, assisting students’ work on the worksheets and giving students feedback.

- Using YouTube to grasp learner attention and provide broad ideas about the text;
- Teaching new words with PowerPoint material and worksheets of quiz activities;
- Letting students watch a teacher-made video that explains language structures;
- Leading students to translate the text in a group, to comprehend the text’s gist and to develop their rationales through discussion.

For material development, through negotiations, Eun-ju created worksheets for text translation and word quizzes and PowerPoint material for word teaching. Su-mi developed the video material for language structure by Googling; this initiative reflects her learner identity (Taylor, 2017) and desire to gain professionalism (Orgovanyi-Gajdos, 2016).

In the Phase of Piloting and Strategy Modification

Monitoring strategy implementations, Su-mi became more analytical. She found that a group of different achievers was ineffective to trigger learner interaction. Her word-teaching method was insufficient to lead to student applications. Her video was too long to keep learner attention to the end. Feeling frustrated, but overcoming this and learning from the findings, Su-mi questioned her meanings; she context-sensitively activated learner and researcher identities and metacognitive thinking procedures (Hiver & Whitehead, 2018; McCormick et al., 2013).

Su-mi: The YouTube about conflict between a teenager and his parent clearly caught the students’ attention. It might be that they were immersed in a situation similar to theirs . . . I tried to increase learner participation by having them do word quizzes in pairs . . . and do a reading activity through group work . . . It took them a lot of time to move their desks [to form groups]. I should have let them do this before the lesson.

After reflective dialogues with Su-mi (Cheng & Ko, 2009), and stimulated by Su-mi (Prytula, 2012), Eun-ju modified her strategy. Eun-ju let her students organize their own groups and shortened the video material. Adapting Su-mi’s strategy, she taught the new words at the beginning of the lesson and let the students recycle and contextualize them over the lesson. Then she found enhanced learner participation. Through these negotiated pedagogies, Eun-ju partly achieved both identity realization and verification. The outcomes were shared with Su-mi and were partially reflected in her next practices. In this way, through flexible metacognitive reflection on reflection (Von Wright, 1992) in a comfortable setting, Su-mi and Eun-ju were gradually improving their PI and related metacognitive thinking procedures.

In the Phase of Strategy Implementation and Meaning Modification

Su-mi and Eun-ju became more self-critical, or metacognitive, repeatedly implementing thereshaped strategies and experiencing identity/meaning crises (Keestra, 2017; Sciuchetti et al., 2018; Wiele et al., 2017). Implementing negotiated pedagogies incorporating their findings, Su-mi formed new meanings that high-achieving females preferred GTM and that her personality was conflicting with managing group work. She also revealed an increased desire for professional practice (Keestra, 2017). These responses imply that, through interactive problem-solving, Su-mi developed her PI and related metacognitive thinking procedures:

Su-mi: [I need to] prepare more interesting materials to get the students’ attention and . . . experience many things on holidays in order to enrich teacher talk . . . I think English teachers should be intelligible in multiple areas. Pedagogical texts address many different topics. I often feel that if I have some background knowledge, I’ll be more prepared.

ET formed a meaning that, as group work could be (in) active depending on the learners, teachers should give different amounts of support to different groups, but Su-mi rejected this situated knowledge with her incompetency in managing group work; she selected the safest method for herself with her person identity prioritized (Burke & Stets, 2009). However, as she was to develop alternatives to facilitate learner interaction, it seems that her teacher and researcher identities were actively interplaying to create another negotiated pedagogy. This context-sensitive identity operation and desire for self-development reflect Su-mi’s developing PI and metacognitive thinking procedures (Oyserman et al., 2017).

Being more metacognitive through interactive problem-solving, and stimulated by Su-mi (Prytula, 2012), Eun-ju focused on what to improve (Keestra, 2017). She thus questioned her GTM-based group work with its limitation in maintaining student attention and agreed with Su-mi’s meaning that highly regards teachers’ active acquisition of new pedagogic sources. Having dinner and watching TV, she created a new information-gap activity, which she shared with Su-mi. In this way, their problem-solving continued.
(Jonassen, 1997), and they were evolving together in their dynamic context.

**PI and Metacognitive Thinking Procedures After Collaboration**

In the focus group interview, Su-mi reported that by designing lesson plans, her teaching became systematic, and by conversing with Eun-ju, she learned several know-hows, such as developing level-differentiated worksheets and explaining text structure, and overcame cognitive and emotional challenges. She summarized her experience as “self-reflection,” a metacognitive process. Meanwhile, Eun-ju remembered Su-mi and Su-mi’s passion as stimulation for her reflection. Their responses imply that they operated as metacognition to each other.

Teaching the third graders, Su-mi was forming new meanings about the teaching of reading through endless experimentations; she was still referring to Eun-ju’s meaning. That is, she was an active learner and researcher, developing her PI using metacognition.

Su-mi: I let my students find the topic sentence [of the text] and underline it with a red pen. So I bought a tablet to show my underlining to them through the TV screen . . .

Eun-ju: In our situation, it could be working.

Su-mi: . . . I think that I have to explicitly let the students know what they have to do . . . [After reading] I summarise the text content [for them]. You know, you said it would be good to summarise what they learned at the end.

Eun-ju reported that she learned a great deal from Su-mi concerning forming friendly relations with students and developing materials, and she was still endeavoring to put these into practice. She thought that daily dialogues with Su-mi led her to question her taken-for-granted meanings (Keestra, 2017). Identifying with Su-mi’s pursuit of new pedagogic sources, Eun-ju revealed her caution about ETs, including herself, using their familiar repertoires. Eun-ju’s self-criticism of using accustomed pedagogies implies that she was metacognitive and probably became more so by comparing herself to Su-mi.

Talking about their current interactions, Eun-ju was analytical about, and partly identified with, other teachers’ meanings and practices. Her identification was examined by Su-mi’s monitoring. Aided by Eun-ju’s questioning, Su-mi immediately formed a meaning through a meaning negotiation. In this sense, a professional meeting based on dialogical relations (Johnston, 2000), or verbalisations of cognitions, emotions and actions (Golombek & Johnson, 2017; Keestra, 2017), seems to have the potential to lead meaning negotiations.

Eun-ju: I can understand her [Ms. Jung’s]. As I taught third graders too long [through test preparation], it was also tough for me to change my practice [into communicative] . . .

Su-mi: It seems the same for her. And she wants to lead every student, but you think some students cannot be led well. This seems different among teachers.

Eun-ju: Yeah . . . What about you?

Su-mi: Haha . . . eclectic? . . . as my current students don’t sleep as much as they did.

Compared to Eun-ju, Su-mi admired other teachers’ practices with her flexible meaning systems, while Eun-ju’s meanings based on her long-held beliefs were not easily changeable (Cheng & Ko, 2009; Keestra, 2017); thus, measuring the transformation of Eun-ju’s PI and related metacognitive thinking procedures seems challenging compared to that of Su-mi.

In sum, through spontaneous collaboration, in a personal, social and dialectic way, Su-mi and Eun-ju defined their problems, formed and modified their strategies and evaluated and learned from their implementations. Over the processes, Su-mi often relied on Eun-ju, but through dialogic meaning negotiations and learning from their findings, she gradually improved her meanings constituting her PI and related metacognitive thinking procedures as identified by her becoming more self-critical and pursuing professional practice. Stimulated by Su-mi, and through repeated experimentations, Eun-ju constantly monitored and regulated her taken-for-granted meanings and came to focus on what to improve, which implies that she was improving her PI and related metacognitive thinking procedures. In general, they (a) context-sensitively activated different identities/meanings in order to balance their identity realization and verification, and (b) reshaped their identities/meanings by flexibly learning from each other’s meanings and findings. In these courses, (c) examining their meanings and strategies through individual and interactive meaning comparisons (monitoring) and negotiations (regulations), Su-mi and Eun-ju evolved their PI and related metacognitive thinking procedures, although differently, as the direction and magnitude of meaning negotiations were autonomously determined (Carter & Marony, 2021). Based on these understandings, implications to advance a small group of teachers’ spontaneous collaborations for professional growth are discussed.

**Advancing Spontaneous Collaboration of a Small Group of Teachers for Pedagogical Problem-Solving**

**Transforming the Concept of Teacher Collaboration to be More Flexible**

Retaining their autonomy, Su-mi and Eun-ju negotiated different meanings and findings and pursued partly different objectives and methods through which they developed their PI and metacognition differently. Their dialogues were not
evaluative as in a large community (Cheng & Ko, 2009). Disclosing one’s own weaknesses and the other’s strengths for their ease, they communicated and experienced cognitive changes (Ohlsson, 2013). These imply that, without endeavoring for meaning and action reconciliations and exchanges of negative feedback, any two or more teachers in flexible, spontaneous collaboration can develop expertise, as “the other” potentially facilitates autonomous reflection (Prytula, 2012) and improvement of PI and related metacognitive thinking procedures. That is, teachers may (un)consciously make efforts to teach and act professionally in order to be verified as competent by their interacting teacher(s) as well as their students (Stets & Burke, 2014). When administrators, teacher educators, and teachers comprehend teacher collaboration based on this perspective, they may feel less burdened in forming and participating in collaboration and consider different strategies to support it (see the next sections).

**Establishing School Systems for Teachers’ Effective Spontaneous Collaboration**

Su-mi and Eun-ju experienced different development of PI and metacognition through their autonomous meaning negotiations. In this sense, focusing on improving teacher autonomy (Benson, 2010) and appealing to teachers’ identity as professionals and their related need for developing competence and autonomy (Deci & Ryan, 2015), school leaders can hold sessions, in which teachers learn about effective cases of spontaneous collaboration and perceive it as productive and pleasant (Vangrieken et al., 2015). Then, teachers can be guided to video-record and monitor their own classes, as did Su-mi and Eun-ju. Teachers with a desire to collaborate or an ET and a BT can be combined to teach the same (grade of) students, as did Su-mi and Eun-ju. When two ETs are joined, both may resist changes with their long-held beliefs (Keestra, 2017), and when novices are coupled, both may have difficulty in problem-solving with their insufficient meanings and reasoning skills (Reder & Schunn, 1996). When a novice and an ET collaborate, the former can refer to the latter’s expertise, while the latter may be stimulated to question his or her old meanings and consider new methods (Orgovanyi-Gajdos, 2016), as did Su-mi and Eun-ju; effective couplings can be differentiated according to social factors (Kennedy et al., 2016). Meanwhile, Su-mi and Eun-ju gradually changed their PI and metacognitive thinking procedures through frequent dialogic meaning negotiations (Golombek & Johnson, 2017); Su-mi regulated her cognitive and emotional challenges communicating with Eun-ju, and they experienced meaning negotiations in the casual focus group interview. Thus, if schools allow teachers sufficient time and space for conversations, the feasibility of teacher collaboration may increase, as their “small talks” and “small stories” tend to entail pedagogical topics and implicit meaning negotiations (Vásquez, 2011; Zoshak, 2016).

**Training Teachers With Problem-Solving-Based Professional Development Programs**

The effects of the spontaneous collaboration of Su-mi and Eun-ju suggest the significance of teachers’ professional development through interactive problem-solving in which teachers test and reshape their pedagogic meanings (Flores & Day, 2006). If Su-mi and Eun-ju had been trained in that area, Su-mi could have contributed more to defining the problem and analyzing experimentation, and Eun-ju may have attempted more innovative methods and experienced more plastic meaning modifications. Thus, it seems necessary to have teachers learn about research skills as researchers and learners and solve through flexible collaboration ill-structured pedagogical problems (Pretz et al., 2003) using narrative activities (Golombek & Johnson, 2017), including diary writing, video recording, professional conversations, and the development of lesson plans, as did Su-mi and Eun-ju. In this course, teachers can be guided to verbally compare different meanings, explicate their relationships (Danielewicz, 2001; Freeman & Freeman, 1994), context-sensitively prioritize particular meanings and form (un)common, negotiated goals and strategies, trying to reconcile different dimensions of pedagogical situations (Shulman, 2005). Teachers then test these goals and strategies alongside individual and interactive reflections. In this way, teachers can learn to metacognitively monitor and regulate different meanings, balancing identity realization and verification, and transform their PI and its meanings, recognizing positive aspects of identity crisis. If this learning runs over a long period, teachers will have time for internalizing new meanings (Golombek & Johnson, 2017).

**Increasing the Coherence of the National Curriculum**

Meaning negotiations and pedagogic options of Su-mi and Eun-ju seem to have been limited by the non-coherent national curriculum. When forming goals and strategy, they tried to reconcile conflicting meanings between the curriculum principles of communicative lessons and the expectations of other stakeholders for high student achievement in the reading-focused KSAT; their PI contained the meanings that both regarded these. They thus designed translation-based group work as an eclectic method; while teaching the third graders the next year, Su-mi focused more on teaching problem and analyzing experimentation, and Eun-ju may have attempted more innovative methods and experienced more plastic meaning modifications. Thus, it seems necessary to have teachers learn about research skills as researchers and learners and solve through flexible collaboration ill-structured pedagogical problems (Pretz et al., 2003) using narrative activities (Golombek & Johnson, 2017), including diary writing, video recording, professional conversations, and the development of lesson plans, as did Su-mi and Eun-ju. In this course, teachers can be guided to verbally compare different meanings, explicate their relationships (Danielewicz, 2001; Freeman & Freeman, 1994), context-sensitively prioritize particular meanings and form (un)common, negotiated goals and strategies, trying to reconcile different dimensions of pedagogical situations (Shulman, 2005). Teachers then test these goals and strategies alongside individual and interactive reflections. In this way, teachers can learn to metacognitively monitor and regulate different meanings, balancing identity realization and verification, and transform their PI and its meanings, recognizing positive aspects of identity crisis. If this learning runs over a long period, teachers will have time for internalizing new meanings (Golombek & Johnson, 2017).
for pedagogical problem-solving. Thus, increasing the coherence of the national curriculum through the reconciliation of its principles and test forms will help teachers to be more motivated to develop exponible pedagogies based on the valid individual and interactive meaning negotiations. Such a political support can contribute to teachers’ development and practice of sound professional pedagogy through the reconciliation of different meanings and expectations (Shulman, 2005).

Limitations and Conclusion

By exploring interactive pedagogical problem-solving processes of two teachers, this study tried to reveal how a small group of teachers in spontaneous collaboration evolved their PI and related metacognitive thinking procedures through flexible and comprehensive meaning comparisons and negotiations. Communicating and interacting in the shared context, they autonomously referred to each other’s meanings, reflected on both parties’ meanings and findings and reshaped their own meanings through constant multiple meaning comparisons and negotiations. In this process, and operating as a third metacognition to each other, they dissimilarly enhanced their PI and metacognition (Sciuchetti et al., 2018; Wiele et al., 2017) in personal, social and dialectical ways.

Other teachers in spontaneous collaboration may experience different forms of meaning negotiations and develop their PI and related metacognitive thinking procedures differently. Thus, the current study cannot be easily generalized in its findings and implications, but its significance resides in disclosing the estranged but existent and dynamic teacher interaction unit through an in-depth case-study. The researcher hopes that this study will encourage other researchers to explore various forms of spontaneous collaboration by small groups of teachers and to reveal different rationales to facilitate teachers’ daily interactive professional growth. Through further study, more effective theories and methods can also be developed to more comprehensively measure teacher cognitions, emotions and actions and the enhancement of their PI and related metacognitive thinking procedures. The researcher also expects that related studies would lead daily spontaneous collaboration or interaction of teachers to be considered as one of the pervasive, common, and essential aspects—that is, a “signature” practice of the teaching profession that preservice and BTs need to be trained in during their teacher education programs.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

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