Mentoring Pre-service Teachers: The THIINK4 Reflective Cycle

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Abstract: Establishing a reciprocal relationship between mentors and pre-service teachers is critical in pre-service teacher mentoring. Highlighting self-regulation as a means for managing emotions in the pursuit of meeting long-term goals, this study examined the constructive features that help develop a reciprocal relationship between pre-service teachers and mentors. The study has captured a range of qualitative data from the dyadic process of mentoring (two-way interaction between a mentor teacher and a pre-service teacher): within the pre- and post-lesson conferences between mentors and pre-service teachers and post mentoring interviews with mentors and pre-service teachers. The study highlighted the strengths of mentor facilitated THIINK4 reflective thinking to enhance professional learning: think ahead (at the preparatory stage), think while (at the performing stage), think back, and think forward (at the appraisal stage). The paper highlights the critical role that the reciprocal relationship plays in each THINK stage of mentoring to foster preservice teachers' self-regulation.

Keywords: pre-service teacher education; mentoring; self-regulation; reflective teaching.

Introduction

The approaches to pre-service teacher education in the 21st century and beyond require reimagining and rethinking because the current demands are unique and complex sustaining being a teacher in the current system is a challenge. A plethora of research shows positive impacts of teaching practice in authentic settings (referred to as 'clinical experience' in this paper) (Hobson & Malderez, 2013; Jaspers et al., 2018; Mena et al., 2017), but any clinical experience may not necessarily yield the best outcomes. Supervising teachers, or mentor teachers (mentors here onwards) play a vital role in educating pre-service teachers (Jaspers et al., 2018; Mena et al., 2017; Pennanen et al., 2020); however, numerous factors contribute to developing an effective and meaningful professional relationship between mentors and pre-service teachers (Pennanen et al., 2020).

As Hadwin et al. (2018) argue, professional learning encompasses cognitive, meta-cognitive, psychological, and emotional processes where pre-service teachers require learning, de-learning, and self-regulation. The purpose of the study reported in this paper was to examine pre-service teachers' professional learning through self-regulation (autonomously plan, monitor their performance, reflect, and learn) with the support of mentors helping them through co-regulation (provide support or feedback for them to plan, monitor their performance, reflect, and learn). The mentoring reported in this paper took place in Sri Lankan primary schools where mentors were required to support preservice teachers in their

planning, implementation, and reflection stages. While the study was conducted in Sri Lanka, it has implications for broader contexts.

Literature Review

Developing reciprocal relationships between mentors and pre-service teachers can be challenging in many contexts and various factors affect building such relationships. For example, some studies show that a mentor's role is hierarchical and authoritative in some contexts such as Sri Lanka (Polgampala et al., 2016; Samaraweera et al., 2018), the context in which the study was conducted. A study conducted in Ireland by Ó Gallchóir et al. (2019) found that mentor teachers act as gatekeepers of school culture. Also, a study in Israel by Rachamim and Orland-Barak (2018) found that pre-service teachers failed to establish a positive relationship with their mentors simply because of the dynamics in their power relationships. Such a power relationship as seen by Patrick's (2013) study in Australia led to excessive stress and feelings of burnout for pre-service teachers. Therefore, managing negative emotions is important as studies saw (e.g., Stallard, 2019) that pre-service teachers often fall into a negative trap. Bessette and Bennett (2019) argue that new teachers or pre-service teachers experience "feelings of unsteadiness, tentativeness, and low self-efficacy" (p. 1) due to various reasons including lack of self-regulation and anxiety.

Positive interpersonal relationships can help pre-service teachers manage their negative emotions. Scholars argue that pre-service teachers' "perception of a safe relationship" is "a prerequisite" for the success of pre-service teacher learning (Lejonberg et al., 2018, p. 536). While people tend to operate differently, hold different beliefs, and work within different power structures, "a commitment to collaboration and reciprocity" can help them achieve common goals in mentoring (Patrick, 2013, p. 209). Research also shows that pre-service teachers' self-regulation can be facilitated and boosted through intervention and instruction (Fonagy & Target, 2002; Saariaho et al., 2016). An examination of relationships is vital in fostering self-regulation; for example, a recent study by Righetti et al. (2022) found that "self-regulatory capacity is associated with relationship maintenance behaviours" (p. 674).

Therefore, the study reported in this paper aspired to understand the constructive features of good mentoring relationships to reduce stress and enhance best practices in a hierarchical setting. The study situated mentoring within self-regulation and co-regulation. Self-regulation is the process in which pre-service teachers consciously co-ordinate, monitor behaviour, adjust, and adapt to achieve success in learning situations (Pintrich, 2000; Zimmerman, 2000). Hadwin et al. (2018) note co-regulation as a process in which mentors can assist pre-service teachers in developing such strategies for self-regulation.

The relationship between self-relation and co-regulation is worth exploring to understand the significant role that co-regulation plays in self-regulation. Self-regulated individuals can manage their behaviour well irrespective of the environmental circumstances and experiences they encounter, and they make informed proactive decisions where necessary. They do not react to emotions such as anger, frustration, embarrassment, and they are more resilient and have greater control of emotions. Research argues that self-regulating can be learned and fostered with the right intervention (Dale & Green, 2018). Hadwin et al. (2018) argue that self-regulation is not automatic and "it is socially situated" (p. 85) and they also say that "regulation emerges when learners engage with personally meaningful learning activities and situations infused with (a) personal meaning, (b) outcome utility, (c) task value, and (d) past experiences" (p. 87). In this way, in social situations, mentors can support their mentees to develop measures to adjust their behaviour through co-regulation.

Co-regulation, as argued by Hadwin et al. (2018), stimulates "appropriation of strategic planning, enactment, reflection, and adaptation" (p. 87). This happens "through interpersonal interactions and exchanges" (p. 87). Therefore, co-regulation creates affordances for self-regulated learning; and interaction can help people reflect on their feelings, perceptions, and emotions. For this reason, this study examined the advantage of co-regulation as it can foster people's self-regulation in social situations. Saariaho et al. (2016) also pointed out that "self- and co-regulated learning are needed in teacher education, both simultaneously as well as for different purposes in learning activities" (p. 57).

Research has seen self-regulation and co-regulation (Hadwin et al., 2018; Righetti et al., 2022) as two important processes in both learning new tasks and fostering relationships. Hadwin et al. (2018) pointed out the need for capturing "empirical data from coding conversations and interactions with data about intent, beliefs, and the trans activity of regulatory interactions, as well as distribution of regulatory expertise over larger episodes of collaborative learning" (p. 99). This study addressed this need by examining naturally occurring data in conversations and interactions.

Self-regulation in The Context of Mentoring

Social cognitive theories assume that learning is both social and cognitive, where the learner makes active adjustments to learning through self-regulation and motivation (Hadwin et al., 2018; Pintrich, 1999; 2000). Self-regulation is seen when learners take control over cognitive, metacognitive, behavioural, and motivational aspects of learning while also managing the multitude of emotions to stay calm and focus on the set goal. While self-regulation is a process of analysing tasks, strategies, monitoring, and reflection within the self (Saariaho et al., 2016), co-regulation occurs with "coordination of self-regulation amongst self and others" (Hadwin et al., 2011, p. 68), to help clarify expectations of a task. Co-regulation allows learners to create new knowledge (Volet et al., 2009) and profoundly impacts self-regulation (Saariaho et al., 2016). As Hadwin et al. (2018) define, "co-regulation involves transitional and flexible stimulation of regulation often through interpersonal interactions and exchanges" (p. 87).

Similarly, socially shared regulation is where groups take ownership and control over meeting specific goals that impact individuals meeting goals. In mentoring pre-service teachers, it is expected that co-regulation is in operation where mentors assist pre-service teachers to develop their self-regulatory skills and when both parties work at their best given the opportunities in the context. However, in mentoring situations, people do not consciously think that they are supporting people to self-regulate, even though they work with their mentees to change and monitor their cognition, metacognition, motivation, and emotions. They inadvertently may use numerous strategies to help pre-service teachers self-regulate through processes such as modelling good behaviour, offering feedback, scaffolding reflection, and managing emotions that yield positive outcomes and self-regulatory learning. Time and monies are invested in pre-service teacher professional development, but some mentors receive little or no support in undertaking this pivotal role (Leshem, 2012; Long, 2009). Hence, it is vital to support both mentors and pre-service teachers to develop a positive relationship to foster self-regulation.

Research into Mentoring in Pre-service Teacher Education

Mentoring may mean different things to different people, and expectations can vary based on the context in which it is used. In a general sense, mentoring in pre-service teacher education can be understood based on the interpersonal relationship, particularly through the lens of mentors and pre-service teachers; A mentor is seen as a guide, collaborator, critical friend, and supporter (Rachamim & Orland-Barak, 2018). When both the mentor and pre-service teachers attempt to achieve similar goals and are working collaboratively, the role can be illustrated as a collaborator or partner which is becoming more common now (Betlem et al., 2019). However, multiple factors influence effective mentoring (Roegman & Kolman, 2020) including helping pre-service teachers to set goals, analyse tasks, use teaching strategy, monitor, and reflect (Saariaho et al., 2016).

Whatever term is used to explain the interpersonal relationship between the two, mentoring is generally offered with the expectation that novice teachers continue to undertake professional development. This expected professional development can be in a range of areas, including the increase in pedagogical knowledge, specific content knowledge and increasing familiarity with the curriculum implementation. However, Garza et al. (2019) argue that mentoring roles are fluid and changing "as they engage in collective action" (p. 4).

In the modern era, more nuanced definitions seem to emerge as mentors play different roles at different times. For example, Ó Gallchóir et al. (2019) saw mentor teachers take a gatekeeping role instead of supporting pre-service teachers. Their mentor teachers or 'cooperating teachers' ensured that pre-service teachers followed the schools' protocols and procedures. They guided them extensively through "workflow and planning of materials" (Ó Gallchóir et al., 2019, p. 382). Recent literature also suggests that mentoring can be challenging (Jaspers et al. 2018; Mena et al., 2017). A recent study by Lejonberg et al. (2018) found that mentors who were committed to the responsibility of enabling pre-service teachers to grow, seem to develop a very good relationship with their pre-service teachers. These authors argue that "pre-service teachers' perception of a safe relationship is an important prerequisite for a mentors' positive influence on pre-service teachers" (p. 536). When such needs are not met, pre-service teachers' development can be hindered which may result in decreasing pre-service teachers' self-efficacy. Clear evidence in research shows that self-regulation can be boosted through intervention and instruction (Fonagy & Target, 2002), thus, the mentoring relationship plays a vital role in self-regulating pre-service teachers.

Most problems concerning pre-service teachers and mentor relationships occur due to a lack of clarity in the role and the uneven and unstructured nature of the so-called 'apprenticeship'. Similar problems may occur if mentors and pre-service teachers do not necessarily agree with each other's teaching philosophies, especially if the mentor is also an assessor (Roegman & Kolman, 2020). Mentoring styles can also influence pre-service teachers' perception of the mentor, while some personality problems may also give rise to unhealthy relationships. Teachers' strong beliefs about teaching may create problems for both mentors and pre-service teachers while differences are inevitable, "a commitment to collaboration and reciprocity" can increase the effectiveness of mentor learning (Patrick, 2013, p. 209). The examination of the factors that influence successful collaboration in each context is necessary to increase the effectiveness of mentoring (Rachamim & Orland-Barak, 2018) and increase pre-service teachers' self-regulation. The study posed two research questions to guide the inquiry of this relationship building between mentors and pre-service teachers.

1. What constructive features help mentors and pre-service teachers develop reciprocal relationships?
2. What factors enable or thwart pre-service teachers' self-regulation?

A Theoretical Framework

This study is rooted in research into self-regulated learning, which applies to any kind of learning situation and learners. Pintrich and Zusho (2002) defined "self-regulated learning as an active constructive process whereby learners set goals for their learning and monitor, regulate, and control their cognition, motivation, and behaviour, guided, and constrained by their goals and the contextual features of the environment" (p. 64). This definition highlights the need for learners to take an active role by monitoring, maintaining, and controlling their cognition, motivation, behaviour, and emotions. It also shows the three active domains in self-regulation: cognition, motivation, and behaviour. According to Zimmerman (2002), there are some important processes in self-regulation: determining goals and restructuring them based on the context, determining strategies for meeting such goals and performance, monitoring the development process and undertaking self-evaluation to improve future practice. Self-regulation is not automatic (Orhan, 2008). Hadwin et al., (2011) show the benefits of co-regulation, which is "described as a reactive, independent and transactional process in which a group negotiates agreement related to goals, plans, monitoring and evaluation of learning" (p. 84). Saariaho et al. (2016) based on the views of Puustinen and Pulkkinen (2001) showed the benefits of pre-service teachers developing more opportunities for co-regulation through goal setting and task analysing, at the preparatory stage, strategy use and monitoring at the performing stage and reflection at the appraisal stage (Saariaho et al., 2016, p. 55). These stages of reflection closely align with the stages of reflection proposed in Schon's (1983) model that stresses the role of reflection in action and on action.

Mentors as co-regulators can provide useful feedback for pre-service teachers to perform the above roles that Saariaho et al. (2016) explained as strategies for self-regulation. Nicol and Macfarlane-Dick's (2006) feedback model presents seven principles that help develop self-regulated learning through effective feedback: clarify goals and tasks; facilitate self-reflection; deliver high-quality feedback on teaching strategy use; encourage monitoring of self and student behaviour; encourage positive motivation and self-esteem; provide opportunities to know and close the gap and ask questions to improve teaching. We saw a clear alignment between Nicol and Macfarlane-Dick's (2006) feedback model and Saariaho et al., (2016) self-regulation framework. We argue that these two models provide a platform for mentors and pre-service teachers to develop a reciprocal relationship, therefore, in the data analysing stage, this study used Nicol and Macfarlane-Dick's (2006) feedback model Saariaho et al., (2016) self-regulation framework to examine whether mentor teachers' feedback was aligned with the categories in the model as evident in their interactions. The study also examined pre-service teachers' responses to feedback as evident in their interactions and their behaviour. The two models served as a framework for analysing naturally occurring data (see Figure 1 below).

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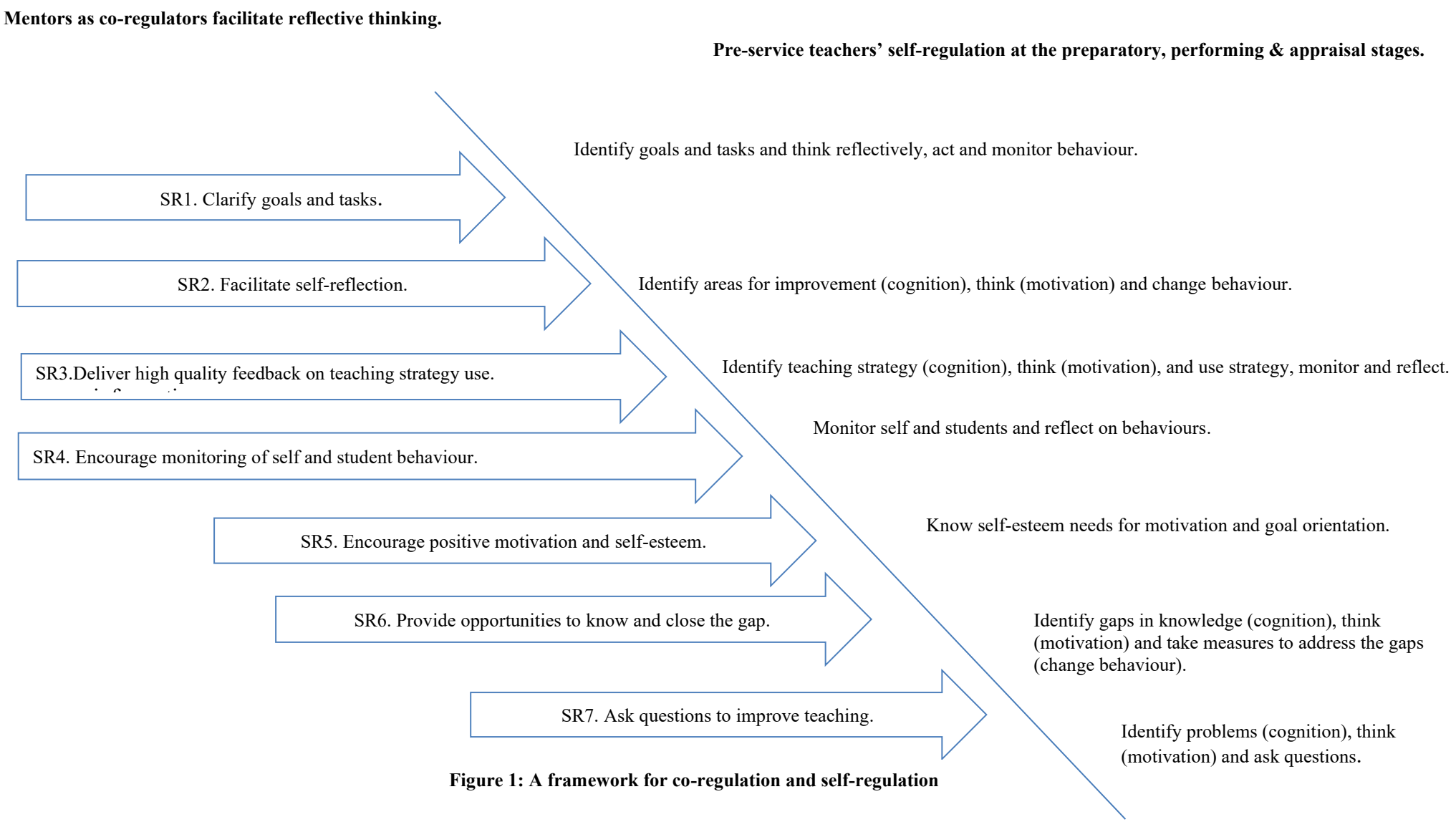

Figure 1: A framework for co-regulation and self-regulation

Method

This is a qualitative study incorporated two data sources from semi-structured interviews, and recordings of mentors and pre-service teachers' conferences to examine the dyadic interaction between mentors and pre-service teachers. This study was conducted in Sri Lanka, and it has captured data from 10 pre-service teachers and 10 mentors (n=20) at different phases of their mentored school placement. In this context, mentors were required to work with pre-service teachers in three different stages in their practicum (preparatory, performing and post performing stages). The data was captured at the preparatory stage of lessons and the post performing stage by recording the live conferences between mentor teachers and pre-service teachers. The study also included data from semi-structured interviews with mentors and pre-service teachers after mentoring has been completed.

Context and Participants

Teacher preparation professional development is overseen by several tertiary institutes in Sri Lanka, including universities. Universities select students to be student teachers in their second year of the degree programs based on their grade point average and their expression of interest. In the Bachelor of Education degree, students take a range of courses, including teaching practice or internships, to prepare them to be teachers in the primary and secondary schools in the country or overseas. School placement is an element towards the end of their degree program and the University seeks support of schoolteachers who receive no training to mentor pre-service teachers. The study was conducted at a reputable university and was crucial to that university to understand areas that need improvements in the program.

The participants who consented to join this study were ten pre-service teachers (2 male and 8 female) (n=10) and their mentors (9 female and 1 male) (n=10). It is a requirement for students in the Bachelor of Education degree to complete ten weeks of school practicum in their final year of the program. The pre-service teachers were between 22-30 who have maintained a high GPA in their degree. The ten mentors (aged between 40-55) were experienced teachers (more than 10 years of experience) in primary school, and they were nominated by the school principal to work with pre-service teachers. Ethical approval has been granted for conducting this study (Reference number, 2075, 2019).

Data Collection

Data was collected from all 20 participants via:

1. Recording of mentor teacher and pre-service teacher conferences before and after lesson implementation.
2. Semi-structured interviews with pre-service teachers after completing mentoring from their assigned mentor teacher.
3. Semi-structured interviews with mentors after mentoring support was provided to their assigned pre-service teacher.

All audio-recorded interactions were in the Sinhalese language which were transcribed and translated into English by the researcher.

Data Analysis

The study used Braun and Clarke's (2006) thematic analysis (TA) based on the themes on Nicol and Macfarlane-Dick's (2006) framework to examine the type of feedback that mentors provided their pre-service teachers (see Figure 1 for the themes). The study examined how pre-service teachers self-regulated in their goal setting, task analysis, strategy

use, monitoring, and reflection (Saariaho et al., 2016). As Braun and Clarke (2012) define, "TA is a method for systematically identifying, organising, and offering insight into patterns of meaning (themes) across a data set" (p. 57). All transcripts were read manually and coded based on the themes as per the framework in Figure 1 above to identify constructive features that enhance self-reflection. Interviews with mentors and pre-service teachers were coded separately based on emerging themes as to what factors enable or thwart self-regulation. The interview questions with each participant focused on the research questions to understand how pre-service teachers' professional development is shaped through mentoring: mentors' strategies for co-regulation and pre-service teachers' strategies for using mentors' feedback for self-regulation.

Excerpts from the conversations between mentors and pre-service teachers	**Themes: Mentor teacher – feedback**	**Themes: Pre-service teacher response (reflection and action)**
MT 6: You know that some of your children cannot read. We need to differentiate to help them. PST 6: madam I will read with them, and they can follow me, and I also can help them individually.	SR6. Provide opportunities to know and close the gap. Think ahead.	Identify gaps in knowledge (cognition), think (motivation) and take measures to address the gaps (change behaviour)
MT 4: it was a good lesson daughter, you responded students' needs well. PST 4: thank you madam, the task on the map was difficult for some students and so I changed it. MT 4: great! and it worked well.	SR4. Encourage monitoring of self and student behaviour. Think while	Monitor self and students and reflect on behaviours.
MT 8; ok it was a good lesson, but some students did not do the work; what do you think? PST 8: I know madam, the task was too difficult for them; I will provide different tasks next time. I remember it is called differentiation, right??	SR2. Facilitate self-reflection. Think back.	Identify areas for improvement (cognition), think (motivation) and change behaviour.
MT 1: what do you think of the recording you used in the lesson today? PST 1: yes, madam, I agree with you that students liked the recording. It made a difference in student engagement. MT 1: I am glad you noticed it.	SR3.Deliver high quality feedback on teaching strategy use. Think forward.	Identify teaching strategy (cognition), think (motivation), and use strategy, monitor and reflect.

Table 1: Examples of coding using thematic analysis as per the framework

Results

Conferences Between Mentors and Pre-service Teachers

The data from the conferences has revealed interesting patterns of their interactions. A thorough analysis of the emerging themes from different stages of the study showed mentors facilitated pre-service teachers to self-regulate by using four distinct modes of thinking routines when clarifying goals, task analysing, strategy use, monitoring, and reflections: think ahead, think while, think back and think forward - what we have named 'the THINK4 Cycle' based on Schon's (1983) reflection on action model where he is suggests professionals to think in action.

Think ahead—Our results suggest that pre-lesson conferences were beneficial for pre-service teachers to think ahead of implementing their lessons and get feedback from mentors to show them areas for improvement (cognition), think about them (motivation) and adapt their approaches (to change behaviour). The following excerpts are from pre-conferences where mentor teachers facilitate pre-service teachers to reflect on their teaching strategy use before implementing them. This habituates them to think ahead.

MT1: daughter[1], how do you begin your lesson today?
PST 1: I am going to sing this song, madam.
MT1: ok, that is good, daughter; how are you going to do it?
PST 1: I will sing it, madam.
MTI: is there any way that you can do it in an inspiring way to engage digital learners? Daughter, you can use your phone and record it with music, and play it; what do you think?
PST 1; yes, I think it is a good idea to make it fun, madam.
MT1; you do not have to… but I suggest …so think about it. We need to always think about not what we like but what the children would enjoy. Ok

The examples below are from pre-conference between mentor pre-service teacher groups 2 and 6. These also show good evidence of think ahead for strategy use.

MT6: Do you know that some of your children cannot read? How are you going to help them with their reading?
PST 6: madam, I will read with them, and they can follow me, and I also can help them individually.
MT6: That is good; you always need to modify strategies to help students with diverse needs.

Think ahead—The above episode also shows evidence of mentor teachers facilitating thinking ahead where they are prompt pre-service teachers to think before conducting the lessons, particularly about strategy use, monitoring, and reflection. The below example is about setting goals and task analysing.

MT 2: What is today's lesson about, daughter?
PST 2: I am teaching students about flower.
MT2: perfect focus but what is your end goal?
PST2: they will understand how important flowers are to us and the environment.
MT2: very good, just naming them is not our intention, right? we need to ask them to explore and tell you.
PST 2: thank you, madam, that is a good idea.
MT2: You know, daughter, flowers are part of lives as Buddhists; we use them on many occasions to worship buddha. Are we showing these cultural connections in

[1] Some mentor teachers do not use the first name to address the preservice teacher instead they called them 'daughter' or 'son'. This is assuring a close relationship as per Sri Lankan cultural practice.

the lessons? I would suggest we need to…

PST 2: yes, madam I will change my lesson plan, thank you, madam.

Think while — There were examples from post-lesson conferences where mentors encouraged or appreciated pre-service teachers' conscious attention to 'think while' as a routine when they were in action. Mentors encouraged them to monitor self and student behaviour (SR4) while in action. In the conferences, some pre-service teachers also provided examples of 'think while' where they consciously reflected on their practice and amended their plans or took appropriate decisions while they were in action in the lesson implementation. Below is an example of 'think while' episodes from a pre-service teacher (PT 5).

MT5: That was a good lesson on values and the students did well in writing their stories.
PST5: Yes, madam, there were two students who could not write well, they were a bit unhappy at the beginning of the lesson.
MT5: Yes, I noticed that you amended the task well for them.
PST5: thank you madam, I got them to pair up with Sunil and Nimali who are very helpful kids; so, they helped them with their writing. They ended up creating a great story, madam.
MT5: that was amazing. Well done…

Think back—The following examples from their post conferences show how mentors facilitate think back routines to manage their feelings after lesson implementations.

MT1: what do you think of your lesson today?
PST1: I am happy with the learning outcomes, but I was a bit nervous though.
MT1: why were you nervous?
PST1: I do not know. I forgot most of the things I planned.
MT1: That, is ok we all forget things but always remember the primary goal of the lesson and you will be alright; this is just the beginning.

Mentors also provided time for pre-service teachers to think back and think forward or think future and reflect as in the two excerpts below about teaching strategy use. In such episodes, they get time to reflect on their actions. Mentor teachers as experienced teachers can comment on the gaps they have noted as something that is worth addressing:

MT7: what do you think of the success of your lesson today?
PST7: I think it went well, madam, and I was able to achieve my goals.
MT7: yes, think you did a good job, and you were well prepared, but students were a bit noisy, not paying attention. So, make sure you always have students' attention when giving instructions. You need to give very clear instructions. When you ask the students to stick the picture, they all did not hear you. There are 40 children in this class, right; you need to make sure they listen. Do not answer your questions, give them time to think …
PST7: thanks, madam, I also observed this …

Many of the mentor teachers started their post conferences by getting pre-service teachers to reflect on their lessons by encouraging them to think back and think forward.

Think forward: Think forward in this analysis was to think about future actions as teachers. In this think forward conversations, mentors helped pre-service teachers to identify take-home messages where they encouraged their mentees to remember big ideas that are useful for all teachers. Table 2 below summarises the key themes and subthemes presented in the think forward conversations.

Key themes	Sub-themes	Frequency	Description
Teaching strategy use	Using technology100%	100%	Mentors discussed ways to help students to increase understanding, and retention of content by using technology.
	Using interactive strategies	100%	Mentors emphasised the need for the social construction and collaborative learning.
	Differentiation	30%	They discussed the need for differentiation or modifying learning strategies to include every student in learning.
Monitoring, and reflection self and student behaviour	Classroom management	80%	They talked about behaviour management, strategies and essential skills for classroom management, group, and pair work administration (practice or experience and community).
	Communicating with students	100%	Mentors provided instructions on how to effectively communicate with students.
	Reinforcement, and rewards	80%	They discussed the need for reinforcement to develop students' motivation and growth mindset.

Table 2: The 'think forward' themes emerging from post conferences between mentors and pre-service teachers.

Interviews with mentors

Interviews with mentors revealed that there were three dominant themes that mentors want to help pre-service teachers to be constructive in their learning: their character and self-esteem needs, self-regulation needs for teaching strategy use and social regulation needs (Figure 2 below).

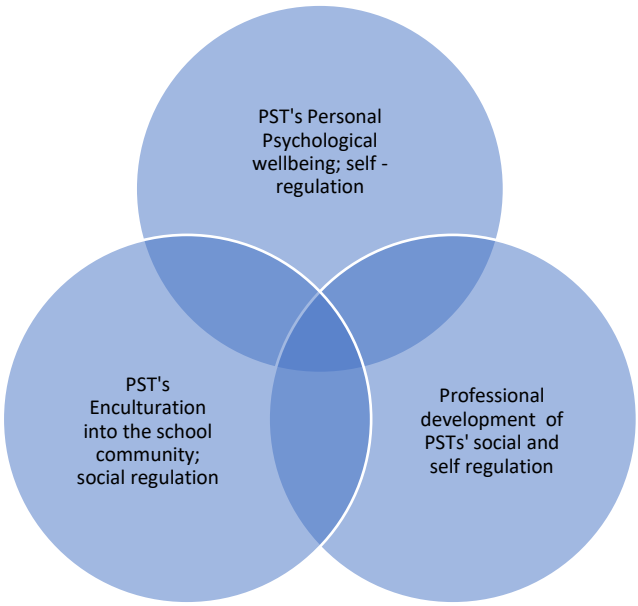

Figure 2. self-regulation needs of pre-service teachers as perceived by mentors.

Pre-service Teachers' Personal Psychological Wellbeing; Self -regulation

Mentors considered that pre-service teachers' emotional regulation is important, and all mentors (100%) acted as co-regulators who assisted them to regulate emotions. Mentors unanimously expressed their accountability for contributing to enhance a reciprocal relationship between them and the pre-service teacher. They also saw personal and psychological needs as crucial elements of keeping the relationship positive. Some mentors showed empathetic feelings and duty of care towards novice teachers, and a few showed their concern for their future students who will be taught by these pre-service teachers if they do not extend their skill.

> *It is our responsibility to help these young people to be good teachers. It is a service to the country and the nation. Like my daughter, they know little about the world, but they will take care of our children (MT 5).*

Pre-service Teachers' Enculturation into the School Community; Social Regulation

Mentors also thought that it was their responsibility to assist pre-service teachers to understand the culture of the school, so they can monitor their emotions in the new community knowing that things are different. For example, MT 1 said,

> *We as experienced teachers know more about this profession; they can learn from our experience; they do not have to go through the path we went; they can clear that up with our help* (MT 1)

Professional Development of Pre-service Teachers; Social and Self-regulation

Some of the mentors (30%) thought that pre-service teachers belong to a different generation and perspectives about teaching are different. MT2 talked about the need for having a good framework to help them with goal setting, task analysing, strategy use, monitoring, and reflection. Researchers did not have a control over how mentoring was organised by the respective university. Researcher were not allowed in the ethical clearance process to intervene in the mentoring business, other than collecting data for the purpose of this study. Mentors seemed to like having a framework for supporting pre-service teachers to control their emotions and mechanism to monitor and adjust behaviour. However, researcher did not provide any information about the models that they may be able to use to help their pre-service teaches for ethical reasons as this nature of intervention needed to be approved by the respective university.

Interviews with pre-service teachers

The themes emerging from the TA analysis of the interviews with pre-service teachers demonstrated different perspectives of mentoring, opportunities for self-regulation and mentor attributes (see Figure 3). A few pre-service teachers (40%) were excited about the clinical experience, while a few were somewhat anxious (30%) and thought there was a lot to learn and the final 30% felt that they were confident with teaching. One pre-service teacher particularly said:

> *It is great to get support from our mentors. My mentor helped me with refining my learning outcomes and all sorts of other related aspects about my lessons, e.g., how to motivate learners but my previous mentor did not go into that depth* (PT 1).

The interviews of pre-service teachers suggested that they (80%) were keen to receive mentoring. Most pre-service teachers discussed the need for mentors to have a suitable approach, knowledge, and skills to assist them in improving their teaching. 20% of them thought they had not learned much in this practicum because their mentor teachers did not help them much. Pre-service teachers (70%) found that some mentors were fully conversant with the content and pedagogy, and they mentioned their advice was worth more than several lectures they have had at university:

> *My mentor's feedback on my lesson was wonderful. She has observed my lesson attentively and she had noticed even minor issues. She told me how I can improve, and she got me to reflect first; it was great to work with her, she is very friendly and encouraging* (PT 8)

However, some pre-service teachers (30%) thought that the mentoring could be improved by enhancing mentor attributes. Several pre-service teachers (included in the above 30%) talked about the need for more clarity in their dialogues by mentors being more specific with their feedback: One pre-service teacher said:

> *I can't complain about my mentor. She is great but I think some of the things she talked to me about my lessons were not clear. I would prefer further discussion* (PT 10).

Most pre-service teachers (80%) thought mentor teachers' personal and professional attributes played a role in developing an effective reciprocal relationship between mentors and pre-service teachers. The three major interconnected attributes were mentors' content knowledge, pedagogy knowledge and their interpersonal skills (see Figure 3 below). The results showed that 80% of the pre-service teachers found that mentors' transferable informed pedagogical content knowledge is extremely important for them to be good mentors. The other 20% of pre-service teachers thought that pre-service teacher's knowledge does not necessarily matter to them as they felt that they could learn the content from other means other than from the mentors. Mentors' content knowledge was another important attribute that 70% of the pre-service teachers valued as they thought that mentors could advise on the accuracy of content and explain with examples so that they could learn by working collaboratively with them. Another attribute of mentors was their strong interpersonal and intercultural understanding which was critical for developing rapport with pre-service teachers.

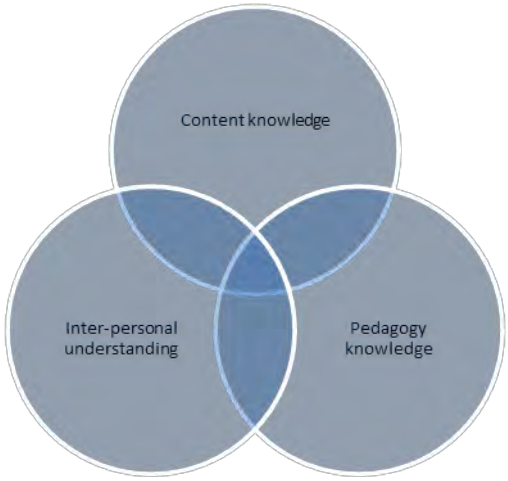

Figure 3. Pre-service teachers' perspectives of MT attributes

Discussion and Implications

The purpose of the study was to identify constructive features that help develop a reciprocal relationship between mentors and pre-service teachers and recognise factors that enable or thwart those relationships. The study has focused on pre-service teachers' ability to self-regulate with support from their mentor teachers and mentors acted as agents or co-regulators. The study analysed data through the lens of a feedback model (Nicol & Macfarlane-Dick, 2006) to examine pre-service teachers' self-regulation in three different stages in their teaching practicum: goal setting, task analysing (pre-preparatory stage) strategy use, monitoring, (performance stage) and reflection (appraisal stage) (Puustinen & Pulkkinen, 2001; Saariaho et al., 2016). The study notably identified a reciprocal mentoring cycle entitled in this paper as the THIINK4 Reflective Cycle (think ahead, think while, think back and think forward) in their professional learning. While the model somewhat resembles Schon's (1983) reflection action model, we see THINK4 routines as a strength of this study for enhancing pre-service teachers self-regulate with the support of mentors' feedback. The THINK4 stages offer a process for both parties to focus on the task and associated reflection.

The Constructive Features for Developing a Reciprocal Relationship

As noted earlier, previous studies have discussed concerns over pre-service teachers experiencing a wealth of emotions that impede their learning in their school placements (Rachamim & Orland-Barak, 2018; Patrick, 2013). The insights from our results showed a potential process to alleviate the issues by helping pre-service teachers manage emotions through mentor facilitated THINK4 reflection when goal setting, task analysing, strategy use, monitoring, and reflection (Saariaho et al., 2016). The THINK4 strategies seemed to have helped remove personal barriers to focus more on their self-regulation needs. Mentors' feedback (SR1-SR7 in Figure 1) facilitated pre-service teachers to clarify their goals and tasks at the preparatory stage (cognition), monitor their teaching strategy use in the performing stage and reflect (motivation) and reflect and appraise after implementation of their lessons.

The study shows the value of co-regulation and social regulation which are useful strategies for self-regulation in social settings (Saariaho et al., 2016; Hadwin et al., 2018). The THINK4 reflective cycle seemed to have a strong influence on their self-regulation. Complementary to Lejonberg's et al. (2018) study which showed pre-service teachers feel safe when they have a positive relationship, this study also supports our premise that reciprocal relationship is fostered through the THINK4 routines. We can argue that pre-service teacher tensions can be minimised by helping them to engage in reflective practice (Carlson, 2019), using the THINK4 routines to concentrate on goal setting, task analysing, strategy use, monitoring, and reflection.

Mentor teachers' three-dimensional knowledge (content knowledge, pedagogy knowledge and interpersonal knowledge) are strong indicators of mentors' abilities to facilitate the THINK4 reflection. The study found that interpersonal knowledge is critical for developing positive relationships. Our results showed evidence of mentors' rigour, scholarship, enthusiasm, courtesy, and commitment to work with pre-service teachers to help them with self-regulation of emotions as also was evident in the study by Mena et al. (2017). Therefore, understanding each other's professional roles is a key element for establishing a professional relationship, as also has been argued in Nickel and Zimmer (2019) and professional communities by Wenger (1998). The THINK4 model assists in goal setting, task analysing, strategy use, monitoring, and reflection.

The majority of mentors in this study provided more specific feedback in each stage particularly helping pre-service teachers to self-reflect to develop pre-service teachers' self-regulatory skills (Zimmerman, 2013; Hadwin et al., 2018). Reflection is a process and a higher-order skill (Dewey, 1933), but not everyone can reflect in the same way. Mentors assist their pre-service teachers to reflect on their practice by asking the right questions to scaffold their thinking process as in think ahead, think back and think forward.

Most mentors demonstrated a high degree of enthusiasm to engage in their role as mentors as also evident in previous studies (e.g., Hobson & Malderez, 2013; Sandvik et al., 2019). As seen in this study, consistently all pre-service teachers thought that mentoring is a skilful act and thus it needs a well thought out process. A consistent approach to mentoring and feedback on each stage (preparatory, performing and appraisal) helps to develop a transactional process that results in a reciprocal relationship and self-regulation through co-regulation as supported in the arguments by Hadwin et al. (2018) and Saariaho et al. (2016).

The Factors that Thwart Pre-service Teachers' Self-regulation

Our results showed some mentors empathised with pre-service teachers as they are novices and had a perception of duty of care to help groom them as teachers. However, a few mentors empathised with their young students or future students, so they had a lack of empathy towards pre-service teachers, and they criticised pre-service teachers for being lazy, not being present in the moment and not working hard. They saw a generational difference in their attitudes to teaching as pre-service teachers. This latter attitude and a lack of self-regulation thwarted them from building a reciprocal relationship. For example, a small minority of pre-service teachers in the current study felt they did not learn much as they did not agree with their mentor teachers' feedback. This results in disagreements and lack of trust between mentors and pre-service teachers as noted in the interviews with pre-service teachers. Previous studies have also seen pre-service teachers experience anxiety (Rachamim & Orland-Barak, 2018; Patrick, 2013) when working with their mentors.

One way to reduce pre-service teachers' anxiety to increase their efficacy is to work in collaboration with other pre-service teachers to re-affirm the professional need (Betlem, 2014; Betlem et al., 2019) through impersonalising feedback for THINK4 reflection where mentors get the pre-service teachers to reflect through rather than them critiquing about their practice haphazardly. Hence, mentor teachers need to be aware of the sensitivities in mentoring to focus on helping the pre-service teachers to self-regulate believing they can improve through co-regulation.

Conclusion

This paper has highlighted how mentors facilitated pre-service teachers to reflect on their actions through the THINK4 reflective cycle (think ahead, think back, think while and think forward). The study provided strong evidence that the THINK4 reflective cycle fosters reflective thinking establishing reciprocal transactions and shows evidence of mentors' three-dimensional knowledge (content knowledge, pedagogy knowledge interpersonal knowledge) that enable their application of THINK4 for goal setting, task analysing, strategy use, monitoring, and reflection. A mentor's feeling of empathy towards pre-service teachers enhances them building a positive relationship. When their relationship is positive, mentors can assist their pre-service teachers to develop them three-dimensionally: culturally, professionally, and psychologically or emotionally. We argue that the THINK4 reflective

routines and appropriate mediation by mentors focusing on the task may be useful to eliminate barriers associated with personal factors such as stress and anxiety in mentoring pre-service teachers. The THINK4 provides a cyclical process where professionals can learn from reflecting on their own actions and the reflection is nurtured through co-regulation. This cycle may also be used in other professional learning environments to foster reflective thinking and reflective practice.

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