

Teacher Education in Pakistan: Studying Teachers' Cognitions and Didactical Strategies

Abid Hussain Shahzad

Promoter:
Prof. Dr. Martin Valcke

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Proefschrift ingediend tot het behalen van de academische
graad van Doctor in de Pedagogische Wetenschappen



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Preface

“In the name of Allah, the most merciful and the most beneficent to man”

Today, when I am writing the preface of my PhD dissertation, my memories took me four and half years back when I was planning for my PhD. I remember the first detailed email I received from a Belgian Professor. I was very happy and in fact indebted that someone has owned me as a PhD student without knowing my limited knowledge, skills, and research experience. Just after a month of my marriage, I packed my bag and came to Ghent University to fulfil the highest dream of my academic life. It was no doubt a pretty long journey to reach at this final stage. But the time passed away swiftly and it transformed the continuous efforts into reality.

My gratitude goes to the one and only challenge-accepting Professor, Dr. Martin Valcke from whom I learnt *never to surrender* in exploring and *keep on moving* to unveil the new avenues of scientific knowledge, skills and research. This milestone was impossible without his continuous support, guidance, and encouragement. Whenever I thought that “it’s really difficult to find the answer of complex research problems”, the next moment he came with many solutions to ease the life. If I were to ask to write one sentence and describe him, I would write for him, *Sky is not the limit*. Here, I would quote the words of a blind essay writer, Hellen Keller, the author of *Three days to see*. When her inner-self asked her, what she would like to see first if her eyesight is restored to her for three days? She replied “the gentle face of my teacher who taught me and opened the outer world to me”.

I am thankful to my guidance committee members, Prof. Dr. Antonia Aelterman, Prof. Dr. Andre Mottart and Prof. Dr. Katrien Struyven for their thoughtful suggestions during the various guidance committee meetings. I appreciate Dr. Jo Tondeur for his time-to-time valuable suggestions for the improvement of research articles. Also, my special appreciation goes to the secretariat office where Anick Lipens, Inge Peirsman, and Rebecca Van der Wiele always provided me the technical support with ever-welcoming and smiling faces.

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collection from the universities and schools. I cannot forget appreciating those students who participated in a semester-long peer tutoring activity in the cold winter mornings with great zeal and patience. Also, much appreciation for the academic and technical staff that provided support during the intervention study.

I am highly grateful to my elder brother, Malik Sabir Hussain Khakhi Advocate, who always provided full support in my studies. Also, I am thankful to my sisters, mother in-law, brothers' in-law, sister-in-law and all relatives, friends, colleagues and fellows for their continuous support in my study. Without their full support, the completion of this great task was simply impossible.

I would say special thanks to my wife Khadija-tul-Kubra, who sacrificed a lot since our marriage. The way she brought up and took care of little children, continued her own studies, and also the way she supported my studies is really matchless. I am also in debit of my little children Muhammad Ahmad and Muhammad Saaim, who always missed me and I missed them too. They always called me to come home and play with them. In fact, their call for home was always heart touching. I always told them that though I am unable to play with them this time, but I am working (in other part of the world) to make their future bright.

Last but not least, I have no words to say thanks to my great parents who know little about PhD but in fact, they enabled me to study at one of the top European universities to achieve the highest goal in my career. *Hats off to my parents* who never went to school but they enabled me to achieve the highest goal and converted my dreams into reality. My father, Malik Rasool Bakhsh Khakhi always remained eager to know the current status and the progress of my PhD studies. I really feel short of words to say thanks to my very sweet and caring and *the best mom in the world*, who always prayed and raised her hands for my success, Thanks Mom.

At the end, I would like to dedicate my PhD to my great parents.

Abid Shahzad

Ghent, July, 2016

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1

General Introduction

Chapter 1

General Introduction

Aim of the dissertation

Pakistan reflects the worst educational performance indicators around the globe. The country ranks 113 out of 120 countries on the educational index (UNESCO, 2015). It spends only 2.1% of its GDP on education. Therefore it is wonder this results in the world's second-highest numbers of children out of schools, i.e., 5.2 million in 2010. Pakistan mirrors the third largest adult illiteracy in the world. Up to 49.5 million adults are illiterate, from which two-third are women. Almost half of the young rural women in Pakistan never got a chance to go to school (UNESCO, 2015).

The situation in Pakistan general education is reflected in the way teacher education is weakly developed. From a broader Asian perspective, studies indicate ITE is facing considerable deficiencies in policy-making, goal planning, curriculum development, teacher training and the adoption of varying types of didactical approaches (Morris & Williamson, 2013). The situation of initial teacher education in Pakistan is not different from other neighbouring countries such as Bangladesh and India (Ahmad, Reba, & Ullah, 2014; Sharma, Forlin, Deppelera, & Guang-xue, 2013).

The literature reveals that in Pakistan almost 90% of all teachers received an initial education, but the results of their teacher training is not reflected in student performance and competences (Ali, 2011). Surveys, international agencies report, educational policies and government's five years plans indicate that the quality of initial teacher education and in-service teacher education programs in Pakistan are not up to the international standards (UNESCO, 2006). Teacher educators are unable to inline their didactical strategies with the desired objective of ITE. Additionally, there is an absence of lesson planning element in the entire teaching activity in ITE institutes in Pakistan (Rizvi, 2015).

While navigating through the literature, there is hardly – context relevant - research focusing on teachers' self-efficacy beliefs and pedagogical beliefs with the adoption of didactical strategies in Pakistan's initial teacher education. There are a number of studies on an overall improvement of initial teacher education, but with a focus on financial issues,

institutional infrastructure and a critical general appraisal of government policies about ITE. We hardly find initial teacher education research regarding teacher competencies, teacher identity, professional development, teacher behaviour and teacher cognitions, etc. This brings us to the focus of the present PhD that centres on meeting some challenges of ITE.

Around the globe, the literature reiterates a continuous discussion regarding challenges of initial teacher education (ITE). During the last decades, teacher educators, curriculum developers, policy makers and the heads of ITE institutes expressed their concern about a theory-practice gap in initial teacher education as well as in in-service teacher education programs. Authors stress this theory-practice gap leads to lower teaching standards (Korthagen, 2010; Valcke, 2013). Authors state in this context that the low quality of the initial teacher education might be due to the weak adoption of the varying types of didactical strategies (Darling-Hammond, 2000; Day, 2013; Korthagen, 2005; Little, 2006; Shulman, 1987; Valcke, 2013).

The former brings us to the main topics being tackled in the present PhD: (1) the current low-level adoption of varying types of evidence-based didactical strategies by (student) teachers; (2) the relationship between the adoption of didactical strategies and (student) teacher cognitions; and (3) the impact of adopting of collaborative didactical approach in Pakistan's initial teacher education.

In view of tackling these topics, we explore in the next paragraphs the conceptual and theoretical base shared by all studies presented in this PhD. This requires the discussion of the following themes: teacher competences, didactical strategies, teacher cognitions (teaching self-efficacy beliefs, pedagogical/teaching beliefs, intrinsic motivation, metacognitive awareness, the status of teacher education and the congruency discussion in ITE and reciprocal peer tutoring.

Conceptual and theoretical base

Qualified teachers reflect a mastery of key teaching competences (Donche & Van Petegem, 2011; Hollins, 2011). A central assumption of the present PhD is that the adoption of a rich variety of didactical strategies validates teacher quality and the related mastery of teaching competences. Authors have also discussed teachers' professional well-being as the quality indicator in teachers in Flanders (Aelterman, Engels, Van Petegem, & Pierre Verhaeghe,

2007; Verhoeven, Aelterman, Rots, & Buvens, 2006). Secondly, we assume that this adoption of didactical strategies is boosted by specific teacher cognitions. Developing high-quality teachers is the central task of initial teacher education. As to the latter, the present PhD present questions about the quality of teacher educators in the teacher education setting (Rots & Aelterman, 2016; Valcke et al., 2010; Vanderlinde, Tuytens, De Wever, & Aelterman, 2016). To attain high future teacher quality, teacher educators should prepare student teachers with adequate insights, knowledge, beliefs, skills, and wisdom (Lunenberg, Korthagen, & Swennen, 2007; Stes, De Maeyer, Gijbels, & Van Petegem, 2013; Struyven, Dochy, & Janssens, 2010; Tack & Vanderlinde, 2014). It is, therefore, critical that teacher educators themselves adopt and implement evidence-based didactical approaches (Lunenberg et al., 2007; Rots & Aelterman, 2016; Stes et al., 2013; Valcke, 2013). This implies teacher educators are able to adopt a wide variety of didactical strategies in the shaping up of future teachers, and that ITE reflects congruency as to the competences being developed in student teachers (Struyven & De Meyst, 2010; Vanderlinde et al., 2016).

This first paragraph introduces, in the nutshell, the key concepts that will be discussed in the next paragraphs. The starting point is a discussion of teacher competences and how these are related to the didactical strategies that are central in this PhD.

Looking for key teacher competences

The initial teacher education literature is abundant as to theoretical reflections, research, opinion pieces about the key teacher competences to be pursued in initial teacher education (Gilis, Clement, Laga, & Pauwels, 2008; Huntly, 2008). A general definition of competences points at a level of knowledge integration, skills and attitudes (Tigelaar, Dolmans, Wolfhagen, & Van Der Vleuten, 2004). Authors suggest these teacher competences refer to mastery of domain-specific knowledge, organisation of knowledge, pedagogical knowledge, teaching attitude, and communication, etc. (Koster, Brekelmans, Korthagen, & Wubbels, 2005). Other authors present alternative ways to clusters teacher competences. For instance, Zhu and Wang (2014) distinguish between learning competences, technology competences, educational competences and social competences. These competences are considered significant in the preparation of future teachers. Below we graphically represent the competency model as adapted from the authors (ibid, 2014):

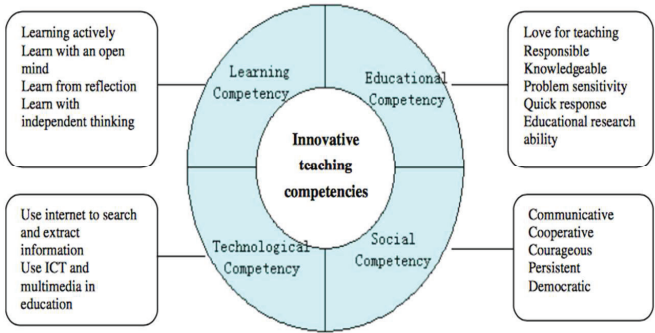


Figure 1. Teacher competency model (adapted from Zhu and Wang (2014)).

The model of Zhu and Wang (2014) reflects to a large extent the TPACK model of Mishra who add an additional information- and communication technology dimension to the discussion (see, e.g., Koehler & Mishra, 2009). They distinguish between (a) technological, (b) pedagogical, (c) content and (d) technological pedagogical content knowledge. This additional focus on an ICT-related dimension is also found in the UNESCO (2008) model. In literature, long lists of teacher competences are being discussed linked to knowledge about the student, knowledge of curriculum, teamwork, monitoring the student’s learning performance, communication, and problem- solving, etc. (Zhu & Wang, 2014). A typical example of a resulting competency framework – from the Australian educational context - is listed below (Department of Education and Training, 2004):

- Know students and how they learn
- Know the content and how to teach it
- Plan for and implement effective teaching and learning
- Create and maintain supportive and safe learning environment
- Assess, provide feedback and report on student learning
- Engage in professional learning
- Engage professionally with colleagues, parents/carers and the community

The literature stresses teacher competences are based upon varying teaching strategies that link underlying knowledge and skills, such as: involving students in the learning, focusing on individual differences, managing difficult learning situations, boosting students’

abilities, providing active learning environment, developing leadership abilities, transferring in-depth knowledge and developing content for innovative teaching (Hollins, 2011; Hong, 2014; Horng, Hong, ChanLin, Chang, & Chu, 2005; Korthagen, 2004; Korthagen, 2010; Lunenberg & Korthagen, 2003; Smith, 2010; Valcke et al., 2010).

Mastery of teacher competences enables (student) teachers to select adequate didactical strategies that are considered important for effective teaching-learning processes (Hong, 2014). Selecting and implementing adequate didactical strategies guarantees teachers attain the learning objectives (Trees, 2013; Tudor, 2006). In the next paragraphs, we explain the nature of these didactical strategies and develop a typology used in the current PhD.

Didactical strategies: towards a typology

Didactical strategies are defined as concrete teaching approaches, consciously selected and implemented teacher actions in view of attaining learning objectives in students (see, e.g., Jones & Tanner, 2002; Valcke et al., 2010). The latter goes back to the different clusters of competences referred to by Zhu and Wang (2014) that require teachers to adopt a wide variety of strategies to be able to choose adequate behaviour to invoke learning, educational, technological and social competences or – when building on the TPACK model – to invoke technological and pedagogical content knowledge. Each cluster helps attaining the learning objectives in different ways. It is, therefore, obvious that teachers adopt and implement very different didactical strategies in the classroom in view of the attainment of specific learning objectives (Darling-Hammond, 2006).

Differences in didactical strategies can be identified in different ways. Chickering and Gamson (1989) base their distinction on seven principles that define didactical strategies. These principles refer gain to the critical need to guarantee that these strategies help attaining the learning objectives:

1. Encourage contact between student and faculty
2. Develop reciprocity and cooperation among students
3. Encourage active learning
4. Give prompt feedback
5. Emphasise time on task

6. Communicate high expectations
7. Respect diverse talents and ways of learning

Another way of specifying didactical strategies is by looking from a historical perspective. In this way, we observe a shift from teacher-oriented (also labelled as theory-oriented and rote learning) to student-centred didactical strategies (Darling-Hammond, 1996; Hermans, Tondeur, van Braak & Valcke, 2008).

Student-centred didactical strategies are often labelled as ‘constructivist’ and teacher-centred are labelled as ‘traditional’ teaching strategies. Describing the student-centred approach, Mayer (2010) explains this requires teachers invoking an active learning process in which learners are active sense-makers and seek to build coherent and organised knowledge. Cannon and Newble (2000, pp. 16-17) define student-centred didactical approaches as “ways of thinking about teaching and learning that emphasise student responsibility and activity in learning rather than content or what the teachers are doing”. In the literature, student-centred didactical approaches are also labelled in different ways; i.e., student-activating didactical methods (Struyven, Dochy, Janssens, & Gielen, 2006), problem-based-learning (Dochy, Segers, Van den Bossche, & Gijbels, 2003), powerful learning (De Corte, 2000), discovery learning (Mayer, 2004) and collaborative/cooperative learning (Slavin, 1995).

In contrast to student-centred didactical approaches, teacher-centred didactical strategies mainly focus on lecturing methods, disciplined teaching methodology and strict teacher-based classroom decisions regarding teaching and learning (Orlich, Harder, Callahan, Trevisan, & Brown, 2009). Following traditional didactical strategies, teacher impart information and knowledge to the students who remain passive (Prince, 2004).

In view of the present dissertation research, we build on an eclectic integration of types of didactical strategies. By comparing a number of key authors, we developed the following table in which we compare a typology presented by Van de Grift (2007) with typologies/distinctions presented by other authors.

Table 1. Comparison of different typologies for didactical strategies

Authors	Type1	Type 2	Type 3	Type 4	Type 5	Type 6	Not aligned
Van de Grift (2007)	Strategies that foster the learning strategies by learners	Matching student characteristics with teaching	Students' active engagement in the classroom	Effective teacher instruction strategies	Organising the teaching activities	Positive classroom climate	
Horn et al., (2005)	Strategies to address complex learning problems		Developing students self-confidence for active participation	Developing connection between teaching and real life		Positive student-teacher relationship strategies	Use of audio visual aids in the classroom
Perrott (2014)	Simplifying the complex problems	Student previous knowledge matching strategies			Orderly management of lessons		Developing student presentation skills
Trees (2013)	Cooperative strategies by learners	Cater the needs of diverse students	Student group dynamics	Illustration of difficult content	Student formative assessment strategies	Comfortable class environment optimise learning	Question answer strategies
Westwood (2008)		Managing individual differences in learning	Interactive instructional methods	Developing liaison between student and teaching		Democratic class environment	Explaining learning material from concrete to abstract

From the table, it is clear most typologies/distinctions are interrelated. Most types reappear in the different classifications. In the column 'not aligned', we perceive especially very specific strategies that in fact could be translated into the more general other categories.

Secondly, it has to be stressed that distinguishing these didactical strategies does not imply they are not related. The teaching process is a holistic endeavour in which didactical strategies are interlinked (Van de Grift, 2007). In the present PhD, we build on the typology

of van de Grift (2007), when discussing the different didactical strategies. In the next paragraphs, we discuss the different types of didactical strategies.

Type 1. Strategies that foster the adoption of learning strategies by learners

Following this type of didactical strategies, (student) teachers adopt and implement strategies that enables the learners to understand the complex learning problems (Horng et al., 2005). The teacher introduces exercises removing difficulties in lesson content and help students to comprehend the knowledge (Westwood, 2008). Simplifying complex problems also helps students with lower level learning capabilities (Perrott, 2014). This type of strategies pushes students to check their solutions (Van de Grift, 2007).

Type 2. Strategies to match the teaching and learning activities to student characteristics

Here, the focus is on individualising didactical strategies in the classroom. Since the classroom is a diverse place of learning, every student possesses a unique person. It is not wise to teach all the students through a single didactical approach (Westwood, 2008). To cater the needs of diverse students, didactical strategies have to address the nature of individual differences (Orlich, Harder, Callahan, Trevisan, & Brown, 2009; Trees, 2013). A competent teacher will apply strategies to analyse the abilities of each student in the class and arrange the lesson as per the individual requirements. This will require probing students' previous knowledge (Perrott, 2014).

Type 3. Strategies to make students actively engaged in the classroom

Following this type, didactical strategies activate students in the classroom. Teachers need therefore select, prepare and deliver challenging teaching materials (Orlich et al., 2009). The teacher can engage students in think-pair-share kind of activities, brainstorm activities and other ways to push new ideas (Chickering & Gamson, 1999). Especially choosing interactive strategies is helpful to make student actively engaged in the classroom (Van de Grift, 2007). This boosts students' self-confidence (Horng et al., 2005) and students' vigilance (Trees, 2013). Student-centred didactical strategies are more apt to keep students actively engaged in the classroom (Westwood, 2008).

Type 4. Strategies that centre on effective teacher instruction

These didactical strategies invoke clear explanations of the learning content during

instruction (Killen, 2012; van de Grift, 2007). The teacher helps and monitors students' learning activity while developing a liaison between teaching and student interest and his/her ability (Westwood, 2008). Students are encouraged to raise questions (Trees, 2013). The strategies also try to establish a connection between the teaching content and real life (Hornig et al., 2005). And most of all, the teacher provides feedback to students and monitors whether lesson objectives have been achieved.

Type 5. Strategies that help to organise the teaching activities

These strategies require teachers to consider the sequencing and order within and between activities. Orderly conducted lessons are critical (Van de Grift, 2007). This is often referred to as classroom management strategies and is considered as a type of very effective didactical strategies (Chickering & Gamson, 1999). It is also linked to a strict planning of (summative and formative) evaluation, (Perrott, 2014; Trees, 2013). It additionally requires strict of time management (Orlich et al., 2009).

Type 6. Strategies to develop the positive classroom climate

Following this type of strategies, teachers focus on a positive and healthy teacher-student healthy and supportive student-teacher relationship (Wubbels & Brekelmans, 2005; Wubbels, Levy, & Brekelmans, 1997). To optimise learning, students are allowed to speak freely, share ideas, and take initiatives. This helps them feeling comfortable (Trees, 2013). Establishing such a congenial and friendly learning environment plays a significant role in the mental boost up in students (Killen, 2012). It is also, labelled as developing a democratic environment ensuring the development of self-confidence of learners (Westwood, 2008).

The above-mentioned typology of didactical strategies is discussed throughout the current dissertation. Further, we base our PhD on the three layers (behaviour, competencies and beliefs) of the onion model – discussed below - when talking about teacher's professional identity. The adoption and implementation of didactical strategies represents behaviour and competencies and is linked to specific teacher cognitions (i.e., teaching self-efficacy beliefs, pedagogical beliefs, intrinsic motivation and metacognitive awareness). We stress in this context the relationship between the adoption of didactical strategies and these teacher cognitions.

Teacher cognitions

Empirical research indicates that the adoption and implementation of didactical strategies is influenced by a variety of factors; such as teacher training, teacher beliefs, teacher's personal identity, and teacher's self-actualization (Struyven et al., 2010; Suleman, Aslam, Habib, Gillani, & Hussain, 2011). The latter factors refer to teacher cognitions, discussed in the next paragraphs.

Generally, teacher cognitions are described as the set of beliefs, self-perception and opinions of teachers about teaching. Defining teacher cognitions, Borg (1999) conclude that actually teacher cognitions are stores of beliefs, knowledge, theories, assumptions and attitudes that play a significant role in shaping teachers' instructional decisions. Burns (1992) is of the opinion that teacher cognitions are beliefs that foster the adoption of didactical strategies and smooth the teaching process. Authors also link teacher cognitions to various individuals' personal attributes such as personal pedagogical systems, theories, conceptions, theoretical beliefs, images and cultural attributes (Fishbein & Ajzen, 1975; Hermans, Tondeur, van Braak, & Valcke, 2008; Korthagen & Vasalos, 2005; Macalister, 2012; Nespov, 1987; Pajares, 1992; Sang, Valcke, van Braak, & Tondeur, 2009).

Teacher cognitions are influential elements that affect teacher behaviour in view of the effective adoption of didactical strategies (Zembylas, 2005). On the other side, teacher behaviour also significantly uplifts teacher cognitions, suggesting a mutual interrelationship between teacher cognitions and behaviour (Clarke & Hollingsworth, 2002). This is central to the onion model of a teacher's identity of Korthagen and Vasalos (2005).

According to the onion model, a teachers' identity is based on five layers, i.e., behaviour, competency, belief, mission, and identity. Behaviour and competences are the outer layers. Belief, mission and identity are the inner parts of the model that provide the base for a teacher's behaviour (Korthagen & Vasalos, 2005). All layers are interlinked with one another. This is, in particular, clear when it comes to the relationship between teacher cognitions (beliefs layer), teacher competences, and teacher behaviour.

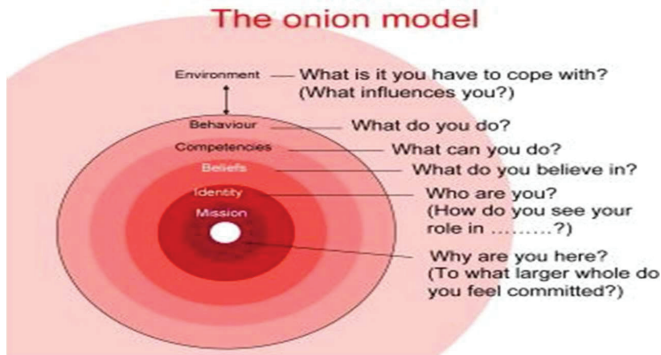


Figure 2. The onion model adapted from Korthagen (2005).

Studies, set up in an initial teacher education context, reveal a positive connection between teacher beliefs and the adoption of didactical strategies and despite this relationship with the adoption of didactical strategies, they are hardly given due consideration in the preparation of future teachers (Valcke et al., 2010).

In the present PhD, we based on beliefs (one of the onion model layers), and build on the following list of teacher cognitions in relation to the didactical strategies:

- Teaching self-efficacy beliefs
- Pedagogical beliefs - teaching beliefs
- Intrinsic motivation
- Metacognitive awareness

The rationale for focusing on this list, is related to the available theoretical and empirical evidence, linking these cognitions to the adoption of didactical strategies by (student) teachers (Goldberg & Cornell, 1997; Kramarski & Michalsky, 2009).

In the following paragraphs, we discuss this list of teacher cognitions (teaching self-efficacy beliefs, pedagogical beliefs, intrinsic motivation, and metacognitive awareness) and how they can be related to the adoption of didactical strategies.

The interrelationship between (student) teachers self-efficacy beliefs and the adoption of didactical strategies

According to Bandura (1977) "perceived self-efficacy refers to beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments" (ibid, p.

3). Self-efficacy beliefs are of paramount importance in educational settings. The literature suggests teachers with higher levels of teaching self-efficacy beliefs adopt specific and successful didactical strategies as compared to the teachers with low self-efficacy beliefs. We exemplify this in relation to the six types of didactical strategies outlined above.

Type 1. Strategies that foster the adoption of learning strategies by learners

This type of strategies helps learners to adopt specific learning strategies, problem-solving approaches and regulation strategies that foster deep learning. Though little empirical research is available linking these concepts, the study of Mazlum, Cheraghi and Dasta (2015) could show how teacher's self-efficacy directly and positively affected the adoption of deep learning approaches by learners. But research findings are not always consistent. Rodríguez, Fernández, Pena, Aguín, and Menéndez, (2014, p.107) had to conclude that "teachers with intermediate self-efficacy perception have more learning-oriented students than teachers with high self-efficacy. Students of teachers who are overconfident of their teaching capacity seem to engage less in studying to learn". Nevertheless, the relationship between the concepts is being underpinned. In the context of goal orientations, researchers found how teachers with higher self-efficacy levels adopt more didactical strategies fostering learners' goal orientation (Kilday, Lenser, & Miller, 2016).

Type 2. Strategies to match the teaching and learning activities to student characteristics

De Neve, Devos and Tuytens (2015) could clearly link teachers' self-efficacy to the extent to which they adopt differentiated instruction approaches that cater for individual student characteristics. The same was found by Chu (2013) when he detected a clear significant relationship between higher levels of self-efficacy and catering for culturally and linguistically diverse students. In addition, there is ample research underpinning the relationship between teacher self-efficacy and inclusive education practices. Donnell and Gettinger (2015) uncovered this relationship while discussing the adoption of response-to-intervention strategies (RTI). And a recent study confirmed how teachers' perceived efficacy goes together with their willingness for teaching in inclusive classrooms involving a sample of in-service teachers from China, Finland, and South Africa (Malinen et al., 2013). Again in an international context, other researchers showed how high self-efficacy levels lead to a more positive orientation towards low-achieving students and the adoption of better teaching strategies (e.g., less criticism for wrong answers, better questioning) that lead to

higher achievement. Focusing on student with learning problems and disabilities, Leyser (2002) found how teachers with higher self-efficacy beliefs would choose more frequently individualised instruction strategies and assessment procedures.

Type 3. Strategies to make students actively engaged in the classroom

Active engagement builds on didactical strategies invoking high levels of student involvement, such as invoked by collaborative learning, problem-based learning, building on authentic cases, etc. Research shows how higher levels in teaching self-efficacy are beneficial to adopt such strategies. Chong and Kong (2012) stress how collaborative learning strategies go together with teacher self-efficacy. Interestingly, this study also stresses how this applicable to the ITE setting. In addition, van Daal, Donche and De Maeyer (2014) found how higher levels of self-efficacy are associated with a higher level of investing in informal interactions. In another way, researchers found how higher levels of self-efficacy go together with a higher level of ICT adoption – in case iPads in the classroom (Minshew & Anderson, 2015). The latter again fosters active engagement of learners. In a more general way, active engagement of learners is central constructivist learning approaches, research of Nie, Tan, Liau, Lau and Chua (2013, p.67) confirm how “the positive correlation between teacher efficacy and constructivist instruction was stronger than the correlation between teacher efficacy and didactic instruction”. In a longitudinal study, Holzberger, Philipp and Kunter (2013) could link higher levels of teacher self-efficacy to – next to better classroom management and individual learning support for students – a positive impact on cognitive activation.

Type 4. Strategies that centre on effective teacher instruction

Central to this type of strategies is the focus on evidence-based strategies, such as giving feedback student monitoring, clear explanations, invoking student questions, etc. Already in 1984, Gibson and Dembo showed differences between high-efficacy and low-efficacy teachers. The former seemed to spend more time in monitoring and checking seatwork, and preparation. They also spent more time in questioning, spent more effort to teach and adopted better teaching strategies.

A recent review study reiterates this and shows how high teacher self-efficacy levels are related to the adoption of didactical strategies such as more questioning behaviour, better

lesson presentation, etc. (Zee & Koomen, 2016). Also Giles, Byrd and Bendolph (2016) found in their recent study that higher teacher self-efficacy levels were associated with more pupil questioning, more lesson planning and a higher degree of effective teaching strategy selection. These recent studies reiterate what was already stressed in 1996 by Czerniak and Lumpe when they stated how choices for evidence-based strategies in science education - e.g., inquiry learning – depend on the self-efficacy of teachers to adopt effective lecturing styles, to move beyond the textbook, and even resistance to teach subjects like science.

Type 5. Strategies that help to organise teaching activities

As stated above, this type of didactical strategies stresses classroom management time management and a strict instructional organisation. Research is clear that student teachers who are “less interventionist regarding instructional and people classroom management beliefs” hold higher self-efficacy beliefs (Henson, 2001, p.1). Furthermore, Dicke et al., (2014) stress how burnout of teachers when dealing with classroom management problems is mediated through teachers’ level of self-efficacy in classroom management. Higher self-efficacy seems to lead to better classroom management strategies. Further, research from the same groups shows how “individuals with a high sense of teacher self-efficacy expect to be able to improve students' behaviour and achievement despite difficulties such as adverse environmental influences (Dicke, Elling, Schmeck, & Leutner, 2015, p.3). Ryan, Kuusinen and Bedoya-Skoog (2015) could show how teacher’s self-efficacy level was positively associated with better management of peer relations in primary and secondary school classrooms. The same was found by Shoulders and Krei (2015) when focusing on the more general relationship between higher teacher self-efficacy and classroom management. The recent study of Ryan, Kuusinen and Bedoya-Skoog (2015) adds to this that teachers from secondary schools and middle schools overall reflect lower self-efficacy levels to manage peer relations and establish a sound classroom management.

Type 6. Strategies to develop the positive classroom climate

The study of Guo, Piasta, Justice and Kaderavek (2010) revealed how higher levels of teachers’ self-efficacy were linked to higher levels of instructional and emotional support; thus contributing to a positive classroom climate. This was confirmed in a later study and added that these teachers also provide more learning support (Guo, Connor, Yang, Roehrig, & Morrison, 2012). Linked to the earlier observation about the link between self-efficacy

and better classroom management, the same research also stress on the improvement of classroom climate (Dicke et al., 2015). This is recurrent observation in the literature (see, e.g., Stewart, 2014). Moreover, the recent research adds to this how higher teacher self-efficacy is strongly linked to more positive student-teacher relationships (De Jong et al., 2014).

The above discussion underpins the relationship of self-efficacy beliefs with (student) teachers' adoption of didactical strategies. In the next paragraphs, we explore the interrelationship of student (teacher) pedagogical beliefs with the adoption of varying types of didactical strategies.

The interrelationship between (student) teachers' pedagogical/teaching beliefs and the adoption of didactical strategies

Teachers' teaching/pedagogical beliefs are a source of a successful teaching–learning process and helps teachers dealing with ill-structured educational classroom situations (Nespor, 1987). Van Driel, Bulte, and Verloop, (2007) clustered beliefs following their affective, evaluative, and episodic nature. But, a predominant typology of pedagogical-teaching beliefs in the literature builds on the distinction between traditional and constructivist pedagogical-teaching beliefs. Traditional pedagogical-teaching beliefs refer to didactical strategies focusing on teacher-centred teaching approaches where learners are supposed to follow strict teacher guidelines. On the other hand, constructivist pedagogical-teaching beliefs provide autonomy to the students and are therefore often called student-centred beliefs (Woolley, Benjamin, & Woolley, 2004).

Authors state that (student) teachers' pedagogical-teaching beliefs are persistent and therefore hard to change (Kagan, 1992; Korthagen, 2004; Pajares, 1992). This explains why – even after attending initial teacher education or professional development, (student) teachers continue adopting didactical strategies less favourable for the specific teaching-learning setting. Authors found that (student) teachers' pedagogical-teaching beliefs play a significant role in the acquisition and transmission of knowledge in classrooms (Borg & Al-Busaidi, 2011; Murphy, Delli, & Edwards, 2004; Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Waters-Adams (2006) reinforced the association between teaching beliefs and classroom strategies, and stated “beliefs were found to be the determining factor in the teachers' decisions about classroom strategies” (p. 919).

Below we explain the interrelationship of pedagogical beliefs with the typology of didactical strategies introduced above.

Type 1. Strategies that foster the adoption of learning strategies by learners

This type of strategies helps learners to adopt specific learning strategies, i.e., solving the complex learning problems, overcoming difficulties in lesson content, and helping in comprehending the knowledge. Less literature is available as to the interrelationship of teaching beliefs with these specific types of didactical strategies. Nevertheless, Raymond (1997) could positively link the teaching beliefs with adequate selection of challenging lesson content (mathematics). Webster (2015) identified a clear link between teacher beliefs and the extent to which students were supported in developing regulation skills. He identified teacher beliefs that attributed inattentiveness and impulsivity to biological unchangeable factors, less likely to foster regulation. In contrast, teachers who stressed a student centred approach – as reflected in their attention paid to the classroom environment, their instructional style, and the fact they wanted to motivate learners – would pursue the development of these regulation strategies. Lastly, Burton and Frazier (2012) found how the adoption of strategies that foster inquiry learning strategies, seems to be strongly aligned with teacher beliefs and their perceptions about the need for teaching inquiry in their classrooms. This reiterates the findings of Ong, Hart and Chen (2016) who – on the base of observations, interviews and surveys – concluded that teachers who focus on deep level thinking, foster questioning by students, engage in discussion with students, reflect particular beliefs about the nature of the learning process and the way pupils function in their classrooms. They state (ibid, p.12): “These beliefs and values to improve student’s thinking appear to be significant influences in guiding the way he used questions and follow-up moves in class”.

Type 2. Strategies to match the teaching and learning activities to student characteristics

Teaching the diverse students always need careful planning and the adoption of appropriate didactical strategies while considering individual differences and student characteristics. Paying attention to student characteristics reflects a dominantly student-oriented approach. This could already be confirmed in an early study of Stanovich and Jordan (1998). Other authors focused on the extent to which teacher beliefs play a role when teaching low-achieving students and select didactical approaches that invoke higher level thinking. They

conclude: “teachers' beliefs in this context are related to their general theory of instruction: viewing learning as hierarchical in terms of students' academic level was found to be related to a traditional view of learning, i.e., seeing learning as progressing from simple, lower order cognitive skills to more complex ones” (Zohar, Degani, & Vaaknin, 2001, p. 469). Ho and Liu (2015) identified two beliefs approaches: instructional and managerial. The latter led to a lesser extent of being able to cope with learner difficulties and disabilities. Also, Leyser (2002) found how teachers' beliefs did affect their capacity to cope with special education needs in both normal and special education learners. Again, student-centred beliefs were a defining factor in teachers.

Type 3. Strategies to make students actively engaged in the classroom

This type of strategies focuses on activating students' engagement in the class, boosting students' self-confidence and applying specific didactical strategies. Authors show how teachers' self-reported beliefs directly influenced student academic engagement through their choices for specific didactical behaviour (Archambault, Janosz & Chouinard, 2012). Other authors explicitly state how a shift is needed from teacher-centred to student-centred beliefs in view of developing stronger engagement of students in the classroom (Larrivee, 1997). But, some others (see, e.g., van Uden, Ritzen, & Pieters, 2014) stress the interrelationship between teaching beliefs and student engagement in the classroom is complex. These authors state: “it is difficult to predict the extent to which teachers are able to foster student engagement, based on their beliefs” (ibid, p. 30). In a parallel study (ibid, 2013) they concluded that the linkage between teacher beliefs and learners' emotional engagement was stronger than the linkage between their beliefs and behavioural engagement.

Type 4. Strategies that centre on effective teacher instruction

Central to this type of didactical strategy is teacher's focus on clear explanations of the learning content, invoking student questions and focused lesson planning. Research confirms how teacher beliefs influence teacher instructional choices and practices (Rubie-Davies, Flint, & McDonald, 2012). Already early studies linked teachers' theoretical beliefs and instructional practices to teacher beliefs. For example, Johnson (1992) linked beliefs to opting for effective instruction in literacy development contexts. Haney, Czerniak and Lumpe (1996) linked teacher beliefs to science education and stressed not to ignore teacher

beliefs. They state how pointless it is to push all kind of effective learning materials, new programs and new projects unless teachers do not move beyond the status quo in science education. They rather emphasise how programs should push teachers to become innovative, to take risks in the classroom, to adopt hands-on/minds-on, ... approaches.

The former exemplifies how this didactical strategy also incorporates a strong focus on opting for evidence-based strategies. In this context, many studies centre on the relationship between teacher beliefs and technology integration in the classroom. The title of the paper of Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur and Sendurur (2012) points at the critical nature of this relationship “Teacher beliefs and technology integration practices: A critical relationship”. Their paper initially reviews how choices of teachers in math, reading and science are heavily influenced by their pedagogical beliefs. But they extend this literature by focusing on the link with educational technology. They stress how – even innovative learning tools and environments such as science labs, computers, Internet usage, do not automatically prompt teachers to adopt more student-centered or constructivist teaching approaches. To the contrary, they state, “The assumption, then, is that increased or prolonged technology use will actually prompt teachers to change their practices toward more constructivist approaches. While this may be true, it has yet to be verified by empirical research”(ibid, p.27). And they further continue on the same page “Although changes in these structures might create more opportunities for teachers to use student-centered approaches, other second-order barriers (i.e., barriers that are intrinsic to teachers and that challenge their beliefs about current practice) may limit their efforts “This summarizes how teacher choices for didactical strategies are to be linked to their core values about teaching and learning.

Type 5. Strategies that help to organise the teaching activities

The focus on orderly conducted lessons, classroom management, time management, and teacher planning is very strongly linked to teacher/pedagogical beliefs. For instance, Pajares (1992) states explicitly: “there is a strong relationship between teachers’ (pedagogical) beliefs and their planning, instructional decisions, and classroom practices” (ibid, p.326). Other authors state “teachers who believed that students must be controlled and cannot be trusted were also more likely to believe that extrinsic rewards are necessary to motivate the students (Woolfolk, Rosoff, & Hoy, 1990, p, 137). The latter illustrates how teacher-centred

beliefs influence classroom management strategies. Hoy and Weinstein (2006) list clear examples how teacher's thinking about difficulties in classroom of teachers affects their practices. They exemplify this with research involving Haitian teachers. Whereas most teachers did not have difficulties with a group, she observed how one teacher struggled with the same group. The authors concluded the difficulty could "not reside in the children" but in that teacher's thinking. This teacher adopted a tradition stance and stressed consequences of behaviour, the other teachers rather stressed group membership, stressed less immediate consequences such as bringing shame to the group or family. The same authors also stress how differences in background culture of learners require teachers to be sensitive as to their beliefs about the origin of classroom disruption, being disaffected from school.

In a more recent study, authors focused on the link between classroom management, beliefs and bullying. They put forward the idea that how teachers think about the nature and origin of student behaviour will affect the way teachers manage students. They exemplify this for instance as follows (Allen, 2010): "On the humanistic end of the continuum are democratic models that see misbehaviour as an opportunity to learn. On the behaviouristic end of the continuum are strategies that make use of punishment, coercion, and rewards. Thus, how a teacher manages student behaviour is impacted by his or her assumptions about children, the models he or she adopts, and the strategies that are commensurate with these models". Especially in critical classroom context, such as the former, teachers are affected by their beliefs. Coles, Owens, Serrano, Slavec and Evans (2015) point for instance, at the way teacher adopt integer classroom practices and clearly state how teachers must hold certain beliefs to achieve effective integrity of classroom management. How acceptable do they consider intervention process? What attributes do they link to disruptive behaviour, to what extent do they want to talk to students, etc? They stress how teacher development programs should therefore not only initiate teachers in adopting particular interventions, but these development initiatives should also address teachers' beliefs.

Type 6. Strategies to develop the positive classroom climate

Central to this type of didactical strategy is a focus on developing healthy student-teacher relationships and a congenial learning environment. Authors have explored the positive

interrelationship between teacher beliefs and classroom climate-related strategies (Deemer, 2004). In her dissertation, Loh (2012) stresses how such teacher ideologies explicitly affect classroom climate. In particular, she stresses – based on observations and interview data – how teachers focus on rigour of instruction or teacher caring and how this affects their choices in teacher behaviour and interactions with students.

Hornstra, Mansfield, van der Veen, Peetsma and Volman (2015) distinguished in their study between “teachers who mainly reported autonomy-supportive strategies and teachers who mainly reported controlling motivational strategies” (p.363) and how this affected classroom climate. They established an empirical link between choosing either of these strategies and external factors (e.g., standards) and internal factors. The latter reflect teachers’ beliefs related to (negative) perceptions of students’ abilities, their behaviour, background characteristics or motivation. Also in her book chapter, Rubie-Davies (2015) stresses how teachers’ beliefs about differences between learners, expectations about learner outcomes, ... directly affect the socio-emotional climate and instructional climate. She emphasises that the way teachers think about the need to respond to students’ emotional and social needs directly attributes to the way they interact with their students. In their book chapter Hoy and Weinstein (2006) stress how teachers’ willingness to be there for them, to listen, and show concern for their personal and classroom life seems critical developing a positive relationship with students. Their input emphasises this not only from the perspective of the teacher but also from a student perspective.

The first two teacher cognitions – teacher self-efficacy and teachers’ pedagogical/teaching beliefs - are studied in detail in the three first research papers incorporated in this dissertation. Two additional teacher cognitions – intrinsic motivation and metacognitive awareness - are only discussed in relation to the fourth study of this PhD. These two teacher cognitions will be linked to the implementation of reciprocal peer tutoring that is considered a congruent didactical teacher education strategy in the ITE context. Discussing congruency in ITE context, authors conclude that “in the congruent teacher education, the education of (student) teachers (curriculum and practice of teacher educators) in in line with the principles that are preached” (Swennen, Korthagen, & Lunenberg, 2004, p. 17). In a study on teacher educators, Swennen, Lunenberg and Korthagen (2008) found that “when supported, not only teacher educators’ ability to link their own teaching to theory is

improved but also congruent teaching help teacher educators to overcome their problems” (p. 531). When it comes to link congruency with RPT strategy, there is only one author (see, Valcke, 2013) who explicitly explain that “ there is an urgent need to recognise teacher training models that reflect a congruency with the way teachers are expected to teach (evidence-based) in their future practice” (p. 53).

This particular RPT teaching strategy can be linked to our didactical strategy typology. It fits both Type 1 (Strategies that foster the adoption of learning strategies by learners) and Type 3 (Strategies to make students actively engaged in the classroom). We first discuss intrinsic motivation (Type 1 and 3 strategies) and next metacognitive awareness in relation to RPT. Considering the particular context of the fourth study; we focus on the relationship between the RPT didactical strategy, selected as a teacher education strategy, and the cognitions of the student teachers in the ITE setting.

Reciprocal peer tutoring (RPT) as a didactical strategy

Reciprocal peer tutoring (RPT) is an evidence-based didactical strategy that increases students’ learning by involving individuals in groups where tutors and tutees play specific roles on a reciprocal basis (Colvin, 2007; Fantuzzo, Dimeff, & Fox, 1989; Fantuzzo, Polite, & Grayson, 1990). The literature on RPT suggests this didactical approach has been very successful in boosting students’ learning, academic achievement, socialization, metacognition and the leadership abilities (De Backer et al., 2012; De Backer, Van Keer, et al., 2015b; Falchikov, 2001; Fantuzzo et al., 1989; Miravet, Ciges, & García, 2014; Pigott, Fantuzzo, & Clement, 1986). The RPT strategy enables all individuals in a particular group to interact with peers freely and exchanges the ideas for the successful learning attainments (Colvin, 2007; Topping, Watson, Jarvis, & Hill, 1996).

In this dissertation, we link the adoption of RPT as a teacher education strategy to foster the learning processes of student teachers, while exploring the relationship with teacher cognitions, i.e., teachers’ teaching self-efficacy, teachers’ teaching beliefs, teachers’ intrinsic motivation and teachers’ metacognitive awareness and regulation.

The interrelationship between (student) teachers' intrinsic motivation and reciprocal peer tutoring (RPT)

Intrinsic motivation is the internal factor of an individual that urges him/her to perform a task for the purpose of self-satisfaction (Ryan & Deci, 2000). Authors found a positive relationship between intrinsic motivation and the selection and implementation of particular didactical strategies in (student) teachers (Csikszentmihalyi, 2014; Cerasoli, Nicklin, & Ford, 2014). Below we discuss how intrinsic motivation can be related to Type 1 and 3 didactical strategies.

In the context of this particular interrelation, we can refer to the self-determination theory as an explanatory framework (Ryan & Deci, 2000). This introduces the question whether RPT helps satisfying the three basic psychological needs of learners: the need for autonomy (getting choice, getting opportunities to act), the need for belonging (sharing, feeling related with others) and competence (feeling able to do something, feeling sure about one's capabilities). But given the focus on Type 1 and Type 3 didactical strategies, the question is to be reformulated as how RPT incorporates these strategies that are to be linked to motivational issues.

Type 1. Strategies that foster the adoption of learning strategies by learners

The literature is abundant as to how RPT pushes the adoption by learning strategies and how this is linked to learner motivation. For instance, De Backer, Van Keer, Moerkerke and Valcke (2015) show how peer tutoring boosts the adoption of regulation strategies and how this is linked to motivational levels. Whereas their study was set up in higher education, the study of Rohrbeck, Ginsburg-Block, Fantuzzo and Miller (2003) involved primary school children. They emphasise how peer tutoring activated student questioning, negotiation, and adoption of different perspectives. They also explicitly link this to the boost in student competence and autonomy, when building on self-determination theory. Also, King stated – already in 1997 – how peer tutoring scaffolds the development of higher level complex learning and at the same time gives a boost to students' intrinsic motivation. She points at the increase in elaborated explanations and questioning skills being developed because of the trans active nature of peer tutoring. These strategies stress learners' goal orientation, problem-solving approaches, and regulation strategies

Eseryel, Law, Ifenthaler, Ge and Miller (2014) revealed how learners' motivation is linked to their improvement of complex problem-solving competencies. Dąbrowska (2011) stressed in the context of language learning how peer tutoring fosters the development of varying types of learning strategies (metacognitive, memory, cognitive, affective and social strategies) and how this is linked to development of motivation; especially in the domain of social motivation (belonging), next to an impact on the feelings of competence (how to manage one's own learning), and competence (feeling of success). Also Allsopp (1997) stresses how peer tutoring pushes – in the context of algebra learning – the development of students' problem-solving skills and higher order thinking skills and how this is linked to motivation. The review study of Topping (1996)- links in a straightforward way peer tutoring to the development of problem-solving skills and at the same time links this to increased motivation especially in the belonging domain of the SDT. Though the latter studies are somewhat dated, they mirror how till-to-date, these positive findings are repeated, even in more advanced learning environments. To exemplify the latter, Tsuei (2012) studied student peer tutoring in synchronous online peer tutoring environments and could conclude how this boosts students mathematics' reasoning skills and how this can be linked to the motivational feedback processes that, e.g., encourage students to collaborate (sense of belonging).

Type 3. Strategies to make students actively engaged in the classroom

Central to this type of didactical strategies is student high-level engagement in the class, developing self-confidence, collaborative learning, and problem-based learning, etc. Research shows how intrinsic motivation is related to the adoption of collaborative didactical approaches, thus leading to larger student involvement. Liu and Devitt (2014) explain this link by reiterating that student (teacher) strive after autonomy, belonging and competence. These three drivers indicate that student (teacher) feel motivated to take/get responsibilities (in the RPT group), when they are trusted (as a tutor) to carry out tasks (autonomy), when they can work together with peers (belonging) and when they are supported to carry out tasks in a successful way (competences). In the context, a study to develop academic writing, O'Sullivan and Cleary (2014) found how peer tutoring increased student engagement with each other and the task and at the same influence motivation through a higher sense of belonging. And also De Backer, Van Keer, Moerkerke and Valcke

(2015) detected the positive connection between peer tutoring, explicit relationship between peer tutoring, engagement (deep level regulation), stronger goals orientation, and motivational goal orientations. The last example is again set up for higher education and studies how student become more engaged in academic reading due to the (virtual) peer tutoring setting. The authors additionally point at related increases in higher intrinsic motivation and autonomous motivation (Park & Kim, 2016). They explain this by pointing at the larger autonomy, perceived competence and the social interactions with the tutee in the tutors.

The interrelationship between (student) teachers' metacognitive regulations and reciprocal peer tutoring (RPT)

Metacognition is explained as the perception of one's knowledge and application of that knowledge in view of successful learning (Efklides, 2009). Researchers distinguish between metacognitive knowledge and metacognition regulation (Schraw & Moshman, 1995). In the literature, especially metacognitive regulation is linked to RPT and students' learning performance (De Backer et al., 2015; Desoete & Roeyers, 2006; Desoete, 2007). Authors distinguish between three sub-categories in metacognitive regulation: planning, monitoring, and evaluation (Flavell, 1979; Schraw, 1998). Planning refers to strategies that answer the basic queries. These queries can be, i.e., how to mainstream cognitive process? What is the focus of particular (teaching) learning strategies? How to attain my (teaching) learning objectives? These basic queries are interrelated with the process of RPT where student teachers are trained to assume the role as a tutor, foster peer's learning performance and focus on achieving RPT session-specific learning objectives (De Backer, Van Keer, & Valcke, 2015). Monitoring refers to the awareness of progress towards the specific (teaching) learning objectives. Evaluation is linked to the judgment about the status of actual performance. It requires individuals to match the end results with the (teaching) learning objectives (Schraw, 1998). Studies in educational perspectives have revealed the significant positive relationship of metacognitions with the student learning achievements (Desoete, 2007). Varying elements of teachers' professional development and didactical strategies are linked with the planning of lesson, monitoring and evaluation of the students in the class (Jones & Johnston, 2010). This introduces the interesting link between RPT, stronger metacognitive regulation, and Type 1 and Type 3 didactical strategies.

Below we discuss metacognition relationship with Type 1 and 3 didactical strategies.

Type 1. Strategies that foster the adoption of learning strategies by learners

As earlier explained, these metacognitive regulation focus on regulation strategies, complex learning problem solving, deep learning and goal orientation. These metacognitive strategies have been strongly linked to the adoption of reciprocal peer tutoring (RPT). Also, other authors could reveal that “higher-order cognitive skills (i.e. elaboration, organisation, critical thinking), metacognitive control strategies (i.e. self-regulation) and collaborative learning strategies (i.e. peer learning) were positively correlated” (Cheng & Chau, 2013).

Type 3. Strategies to make students actively engaged in the classroom

Central to type 3 didactical strategies, is the focus on high levels of student involvement? This is in particular invoked by collaborative learning approaches, such as RPT. Authors, such as Kwon, Hong and Laffey (2013) explain the positive relationship of metacognitive regulations with collaborative learning: “groups who more actively used the coordination support tool established positive interdependence, engaged in positive interactions, and had enhanced group productivity” (p. 1271). Also, Park and Kim (2014) explicitly link peer tutoring, increased metacognitive awareness and deeper engagement when studying a virtual tutee system. But also in face-to-face settings, authors confirm how peer tutoring can be linked to stronger engagement and self-monitoring. The latter being an essential part of metacognition (Roscoe, 2014).

In short, the above discussion focused on the significance of the interrelationship of teacher beliefs with the didactical strategies. To educate future teachers, adopting evidence-based didactical approaches in the actual classrooms, the professional development of (student) teachers becomes vital (Tack & Vanderlinde, 2014; Valcke, 2013; Van Driel & Berry, 2012). In the next paragraphs, we, therefore, focus on the congruency discussion when considering the professional development of (student) teachers. This will introduce the idea to adopt evidence-based didactical strategies as a critical part of teacher education approaches; such as peer tutoring to innovate the initial teacher education practices.

Developing mastery of didactical strategies: challenges for teacher education

Both initial teacher education (ITE) and the professional development (PD) of in-service teachers are challenged to develop the full range of didactical strategies that underpin teacher competences. As stated earlier, research points at the critical theory-practice gap. Literature indicates the fact didactical strategies are weakly and narrowly adopted in the ITE practices where future teachers are being prepared (Dilshad, 2010; Guskey, 2002; Valcke, 2013). In this context, Hattie (2009) especially points at the lack of adoption of evidence-based strategies in teacher education that goes together with either the narrow bandwidth in strategies being adopted and/or the lack of adoption of these strategies by the teacher educators themselves. He criticises the non-data-driven teacher education approaches. The latter is especially disconcerting considering the fact that student teachers are the future generations of teachers in schools should be able to adopt adequate (effective, efficient, satisfactory) didactical strategies.

Darling-Hammond (2006) point at the following critical characteristics of teacher education approaches to be able to develop the full range of teacher competences and the underlying didactical strategies:

- coherence based on a common, clear vision of good teaching that permeates all coursework and clinical experiences;
- well-defined standards of practice and performance that guide and evaluate coursework and clinical work;
- curriculum grounded in knowledge of child and adolescent development, learning, social contexts, and subject matter pedagogy;
- extended clinical experiences carefully developed to support the ideas and practices presented in simultaneous closely interwoven coursework;
- explicit strategies to help student teachers to confront their own deep-seated beliefs and assumptions about learning;
- strong relationships, common knowledge, and shared beliefs that link all who are teaching these prospective teachers;

- assessment based on professional standards that evaluates teaching through demonstrations of critical skills and abilities using performance assessments and portfolios

The above-mentioned characteristics lead towards a holistic teachers' professional development approach that encompasses these educational attributes. Richter et al. (2011, p. 116) define professional development as “uptake of *formal* and *informal learning opportunities* that deepens and extends teachers' professional competence”. In a broader sense, this requires teacher education approaches to push mastery learning of the competences (Guskey, 2002), the development of professional roles of teachers (Beijaard, Meijer & Verloop, 2004) and the full teachers' identity formation (Korthagen, 2004). The question is whether current approaches to ITE are up to this holistic “agenda”? This brings us to the next section in which we stress how “congruency” in ITE might be a key to unlock the door to effective solutions to tackle the problem.

Congruency in ITE: modelling didactical strategies as a key dimension throughout teacher education

Previous research – reported above - reveal a state of the art in which the varied and focused adoption of didactical strategies is weak. Further, we explored earlier how teacher cognitions can be linked to the adoption of didactical strategies. In the present dissertation, we link this to questions about the quality of ITE and especially the way ITE defines and implements a curriculum that fosters the attainment of the competency frameworks. We stress – together with other authors – that IET curricula have to be aligned with the competences being developed in student teachers (Lunenberg et al., 2007). Available research suggests that ITE does – yet - not consistently reflect congruency (Hamilton & Pinnegar, 2013). Also, Polikoff (2013) stresses in this context that she observes a lack of aligned instruction in teacher education. A typical example is linked to how teacher education programmes stress - at a theoretical level - student-centred and collaborative approaches, but in practice, this is not reflected in ITE-practices. The concept of “teach as you preach” is often absent from the ITE classroom (Murray & Male, 2005; Struyven & De Meyst, 2010). Authors stress ITE would have a better impact when teacher educators themselves would practice themselves what they try teaching their student teachers (Darling-Hammond, 2000; Korthagen, Loughran, & Russell, 2006). In line with the research

regarding congruency in teaching strategies, authors (Struyven, Dochy, & Janssens, 2010) in a research on student teachers' adoption of didactical strategies conclude that "students became convinced of the use of the teaching methods in the experiment for their own practice, the majority of students demonstrate reflective practices, make critical judgements, formulate terms or suggest amendments to the teaching methods before simply adopting them for their own future pupils"(p. 44).

In short, we favour congruency in the didactical strategies adopted by teacher educators through the implementation of an intervention study focusing on reciprocal peer tutoring.

As we discussed in the didactical strategies section, Type 3 didactical strategies stress the active engagement of students in the classroom (Chickering & Gamson, 1989; Horng et al., 2005; Orlich et al., 2009). Many authors, therefore, push cooperation among students (Horng et al., 2005; Killen, 2012; Trees, 2013; Van de Grift, 2007). Keeping in mind the emphasis on "congruency", we propose teacher education to model these didactical strategies. To be more specific, we implement reciprocal peer tutoring as a teacher education strategy (RPT). RPT has been presented as a successful collaborative learning didactical strategies (Topping, 1996). As was also stated earlier in discussing the relationship between didactical strategies and (student) teacher cognitions, we link RPT to metacognitive awareness and intrinsic motivation. Going back to our typology, this suggests RPT can also be qualified as a Type 1 didactical strategy that fosters the adoption of learning strategies of students.

In the fifth chapter of this dissertation, we elaborate on reciprocal peer tutoring (RPT), the relationship with teacher cognitions, and further the discussion to adopt it as a baseline strategy for initial teacher education.

Integration of the conceptual and theoretical model of the PhD

When we integrate the above conceptual and theoretical background, we can present the following integrated model for the current PhD.

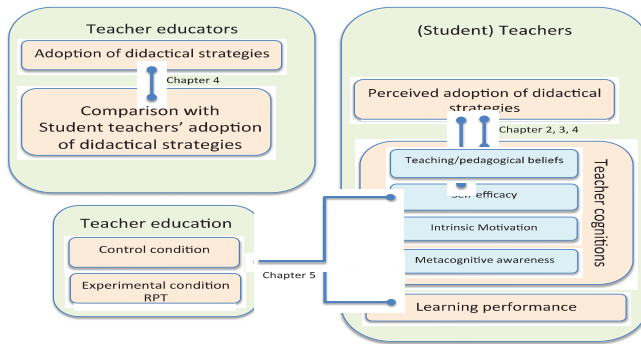


Figure 3. The conceptual and theoretical model of the PhD

Figure 3 shows how the theoretical and empirical base about initial teacher education (ITE) of student teachers and professional development of teachers' leads to studies about the extent to which (student) teachers adopt a wide variety of didactical strategies. The latter is linked to research about related (student) teacher cognitions. In addition, the conceptual and theoretical base pushes forward a reorientation of ITE to adopt reciprocal peer tutoring as an exemplary approach to a congruent teacher education model.

The focus is on (student) teachers and their perceived adoption of didactical strategies and how this is related to their teacher cognitions. This is – as explained later on – tackled in three studies, presented in Chapter 2, 3, and 4. Since we also include a group of teacher educators in the study reported in Chapter 4, we repeat part of the model with a focus on this key actor in the ITE setting. Next, the figure shows our focus on ITE and how RPT could be a promising didactical strategy to be adopted by teacher educators. This RPT is linked to learning performance of student teachers on the one hand and teacher cognitions. This will be discussed in Chapter 5.

In the next paragraphs, we build on this model to present the structure of the PhD and to ground the different research questions being tackled in the different studies reported in the subsequent Chapters.

Pakistan teacher education as the research context for this dissertation

The overall quality of education is dependent on the quality of student teacher training and

teacher education (Akyeampong & Lewin, 2002; Lewin & Stuart, 2003; Little, 2006). The current dissertation deals with the pre-service and in-service teacher education scenarios in the Pakistan context. Worldwide, the literature emphasises, a theory-practice gap in teacher education (Darling-Hammond, 2000b; Korthagen, 2004; Loughran, 2006). But, especially in developing countries, this theory-practice gap is clearly visible and hinders achieving educational goals (Avalos, 2000; Sharma et al., 2013). In the context of this dissertation, the theory-practice gap is assumed being linked to a weak adoption of a wide range of adequate didactical strategies. This will be studied in the Pakistan teacher education and secondary education setting.

Pakistan educational literature especially stresses the low quality of its education as compared to other countries in the world (Khan, 2011). In general, the quality of education provided by the public sector in Pakistan has been poor due to various factors, including: a low level in teacher competence, a lack of classroom-based support for teachers, poor quality of learning materials, a lack of systems to assess student learning outcomes, insufficient resources for teaching and learning materials, etc. (Azam, Fauzee, & Daud, 2014; Khalid & Khan, 2006; Rizvi, 2015).

This poor educational quality pervades into the poor quality of teacher education. This poor quality of initial teacher education is reflected in a strong adoption of teacher-centred teaching approaches, a lack of use of evidence-based didactical strategies, adherence to a non-standardized evaluation/grading system, a rigid curriculum and a weak policy orientation of educational authorities deals on ITE programmes (Khan, 2011; Little, 2006). Pakistan's teacher educators' vision and their professional development does not match the current global needs of ITE (Tahir & Taylor, 2013). The Pakistan ITE curriculum and the methodologies adopted by teacher educators are not congruent or aligned with one another (Mahmood, Ahmed, & Iqbal, 2013).

Currently, there are around 300 teacher education institutions (government/private) in Pakistan training teachers to obtain varying teaching degrees; from the Primary school teaching certificate (PTC) to PhD level. Despite the negative quality profile of ITE, initiatives have been taken or are under progress to uplift Pakistan teacher education. For instance, the Government of Pakistan has initiated a number of projects for the professional development of pre-service and in-service teachers (Mahmood, 2014); and this in

collaboration with international agencies such as the United Nations International Children Education Fund (UNICEF), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Department for International Development (DFID), the World Bank (WB), the Asian Development Bank (ADB), the United States Agency for International Development (USAID).

At government level, a Directorate of Staff Development (DSD) came into existence in 2004 with the sole objective to boost teachers' professional development (Ashraf & Rarieya, 2008). Through DSD, some key trainers were trained to start further training of in-service teachers in secondary schools in Pakistan. Other significant programmes focus on the professional development of teacher educators in Pakistan (Aslam et al., 2012); such as the "Strengthening Teacher Education in Pakistan" (STEP), the "National Professional Standards for Teachers in Pakistan" initiative (NPSTP), Education for All (EFA), Quality Enhancement Cells (QEC).

Thus far, little is known about the impact of these projects.

In conclusion, the current research context can be contextualised as follows:

- the quality of education in Pakistan is low;
- the level of the adoption and implementation of didactical strategies is critical;
- there is theory-practice gap in Pakistan initial teacher education;
- many teacher education development initiatives are in progress;
- collaborative learning approaches such as reciprocal peer tutoring (RPT) strategies are not part of the Pakistan teacher education curriculum and teacher education methods.

Research questions for this dissertation

The earlier discussion and context explicitly call a research program in the Pakistan context to provide an evidence-base about its current status and empirical studies that help uplifting the quality of the educational system. Within the given theoretical and conceptual framework of the PhD study, the general research question of the dissertation explores the linkage between teacher adoption of didactical strategies and how this is related to their cognitions and how this can be fostered by changes in the initial teacher education setting;

more in particular through the adoption of reciprocal peer tutoring as a teacher education strategy. This brings us to the following more specific research questions. Some keywords are put between brackets, depending the focus on actual classroom teachers or on student teachers in the ITE setting:

- RQ1 What is the current state of the art as to the (perceived) adoption of didactical strategies by (student) teachers?
- RQ2 How is the (perceived) adoption of didactical strategies by (student) teachers related to teacher cognitions?
- RQ3 What is the current state of the art as to the adoption of didactical strategies by teacher educators?
- RQ4 Does RPT as an innovative teacher education strategy, positively influence student teacher learning performance?
- RQ5 To what extent is there an interaction through changes in teacher cognitions in the positive impact of RPT as an innovative teacher education strategy on student teacher learning performance?

Overview of the dissertation

We set up four studies to answer the specific research questions. Three studies were set up based on survey instruments. The fourth study was a quasi-experimental pre-post-test study. Each of the studies is presented as a separate chapter in the dissertation that has been accepted/submitted as a research article for a journal and/or has been presented during an international scientific conference. In the table 2, we summarise the research questions and methodology adopted for the individual chapters/studies. At the same time, we give some brief insight into the research design, data collection, and statistical analysis approaches. Next, we briefly outline each of the individual studies as described in the subsequent chapters.

Table 2. An overview of the studies included in the dissertation, together with research question and methodology

Content	RQs	Methodology		
		Variables	Research design and data collection	Data analysis
Chapter 1		General	Introduction	
Chapter 2	RQ 1 & 2	Didactical Strategies adoption Self-Efficacy Pedagogical Beliefs	Survey research Secondary school teachers (n=395) Survey instrument	Descriptive statistics One sample <i>t-test</i> Cohen's <i>d</i> effect size Structural Equation Modelling
Chapter 3	RQ 1 & 2	Didactical Strategies adoption Self-Efficacy Pedagogical Beliefs	Survey research Student teachers (n=250) Survey instrument	Descriptive statistics One sample <i>t-test</i> Cohen's <i>d</i> effect size Structural Equation Modelling Linear regression
Chapter 4	RQ 1 & 3	Didactical strategies adoption	Survey research Teacher educators (n=32) Student teachers (n=250) Survey instrument	Descriptive statistics One sample <i>t-test</i> Cohen's <i>d</i> effect size Structural Equation Modelling
Chapter 5	RQ 4 & 5	Didactical strategy (RPT) Self-efficacy Intrinsic Motivation Metacognitive Awareness	Quasi-Experimental pre-test post-test research Experimental conditions (n=21) Control conditions (n=27) Questionnaires RPT intervention	Descriptive statistics Thematic analysis ANOVA
Chapter 6		General Discussion and Conclusions		

Chapter 2: The perceived adoption of didactical strategies by secondary school teachers and its linkage with teacher cognitions (pedagogical and self-efficacy beliefs) in Pakistan secondary schools

As to the aim of this first study, the current level of the adoption of didactical strategies by secondary school teachers was explored. The purpose was to find evidence as to the weaknesses of initial teacher education programmes by looking through the lens of the current level of adoption of didactical strategies in actual secondary schools' classroom. At the same time, we link this adoption level to two teacher cognitions: pedagogical and self-efficacy beliefs. This study, therefore, deals with the two first research questions:

RQ 1: What is the current state of the art as to the adoption of didactical strategies by school teachers in the secondary schools in Pakistan?

RQ 2: How is secondary school teachers' perceived adoption of didactical strategies interlinked with their cognitions, i.e., pedagogical and self-efficacy beliefs?

To tackle the research questions, survey studies were set up, engaging 395 secondary school teachers from five private and fifteen government owned schools in the Muzaffargarh district of the Punjab province. For the data collection purpose, an existing instrument of Van de Grift (2007) was redesigned to be able to map the reported level of adoption of didactical strategies. Next, the instrument of Woolley et al., (2004) was used to determine teachers' pedagogical beliefs. On the base of an instrument of Bandura (1977) teacher self-efficacy was determined.

Data were analysed by applying descriptive statistics and the testing of regression models to understand the perceived adoption level of didactical strategies and its relationship with teacher cognitions. The findings of this study urged the research to set-up a linked chain with the ITE and explore the same in student teachers. Thus, we set-up the next study in ITE setting focusing on student teachers' adoption of didactical strategies and related cognitions.

Chapter 3: The perceived adoption of didactical strategies by student teachers and its relationship with student teacher cognitions in ITE.

Since the results of the first study – set up involving secondary school teachers - revealed a low level of adoption of didactical strategies, we turned our attention to initial teacher education programmes in Pakistan. Our purpose was to check the nature and quality of actual student teachers' preparation by valuing the perceived adoption of didactical strategies by student teachers. Similar to the first study, we explored the interrelationship of student teacher cognitions (pedagogical and self-efficacy beliefs) with this perceived level of adoption as explored in the earlier study involving secondary school teachers. To keep the study consistent with the earlier study, we administered the same research instruments.

This study deals again with the first two research questions, but now with a focus on student teachers. This also implies that we cannot focus on the "actual" adoption of didactical strategies. Therefore, we change the key dependent variable into "perceived adoption" of didactical strategies. This could also be labelled as a "reported adoption":

RQ 1: What is the current state of the art as to the perceived adoption of didactical strategies by student teachers in the secondary schools in Pakistan?

RQ 2: How is secondary student teachers' perceived adoption of didactical strategies interlinked with their cognitions, i.e., pedagogical and self-efficacy beliefs?

To answer the research question, we conducted a survey study while involving student teachers (n=250) from two top teacher education institutes in Pakistan, i.e., Bahauddin Zakariya University Multan and Institute of Education and Research (IER) Punjab University Lahore. Data for the perceived adoption of didactical strategies were collected using the redesigned instrument of Van de Grift (2007) and for the pedagogical beliefs and self-efficacy beliefs, the existing instruments of Woolley et al., (2004) and Bandura (1977) were used respectively.

Data were analysed by applying descriptive statistics and testing linear regression models to understand the perceived adoption level of didactical strategies and its relationship with student teacher cognitions. AS this study also revealed low-level adoption of didactical strategies in student teachers, the research had the sufficient reason to set up a study for teacher educators and to make a comparison with student teachers' adoption of didactical strategies to find the ultimate gaps. So the next study was set-up for the teacher educators regarding their current state of the art as to the adoption of didactical strategies.

Chapter 4: Current state of the art as to the adoption of didactical strategies by teacher educators and student teachers in initial teacher education in Pakistan

The results of the previous two studies indicate there is low-level adoption of didactical strategies by the secondary school teachers (study 1) and student teachers (study 2). In this study we shift again the focus to develop a comparative overview of both teacher educators' and student teachers' adoption of didactical strategies. This helps to link back to the earlier observations about the poor quality of Pakistan ITE. Focusing teacher educators helps to move away from a "perceived" level of adoption to the current adoption by teacher educators. This fits in a better way the "behavioural" layer in the onion model of Korthagen (2005).

The study deals with two research questions:

RQ1. What is the current state of the art as to the (perceived) adoption of didactical

strategies by (student) teachers?

RQ3. What is the current state of the art as to the adoption of didactical strategies by teacher educators?

To answer the research questions, we conducted a survey study while involving both student teachers (n=250) and their teacher educators (n=32) from two top teacher education institutes in Pakistan, i.e., Bahauddin Zakariya University Multan and Institute of Education and Research (IER) Punjab University Lahore. Data were collected using the adapted instrument of Van de Grift (2007).

Data were analysed with descriptive statistics and by applying Structural Equation Modelling (SEM) to study the linkage between the research variables in teacher educators and student teachers. The results of this study were also similar to the previous two studies and the low-level adoption of didactical strategies was confirmed in secondary school teachers, student teachers, and teacher educators. To tackle this problem, there was a need to put forwards a solution strategy. To tackle this, we put forward an intervention study based on RPT in the ITE to see its impact on student teachers' learning performance.

Chapter 5: The differential impact of reciprocal peer tutoring (RPT) on student teachers' learning performance and the mediating impact of teacher cognitions (intrinsic motivation, metacognitive awareness and self-efficacy beliefs)

The last three studies reflected a consistent low adoption level of didactical strategies. Especially the findings in relation to the teacher educators were of concern. They introduce the key role of teacher educators in establishing high-quality initial teacher education. Since these teacher educators hardly adopt evidence-based didactical strategies this introduces the theory-practice gap and how there is a lack of congruency in teacher education curricula and the competences being developed in future teachers. Keeping in mind the concept of congruency, we designed – in the context of a real-life teacher education setting – an experimental intervention based on Type 1 and Type3 didactical strategies: reciprocal peer tutoring. The purpose of the study was to explore the differential impact of RPT on student teachers' learning performance and to analyse the mediating role of three teacher cognitions: intrinsic motivation, metacognitive awareness, and self-efficacy beliefs.

This study deals with two research questions:

RQ4. Does RPT as an innovative teacher education strategy, positively influence student teacher learning performance?

RQ5. To what extent is there an interaction through changes in teacher cognitions in the positive impact of RPT as an innovative teacher education strategy on student teacher learning performance?

To tackle the research questions, a pre-test - post-test quasi-experimental study was set up. Students in the experimental conditions were involved in a 24 week RPT intervention. Their performance and teacher cognitions were compared with student in the traditional ITE setting. The RPT intervention was set-up in the context of a M.A in Education programme at Bahauddin Zakariya University, Multan: student teachers in the experimental condition (n=21) and control conditions (n=28). RPT was implemented during a semester-long period in the subject of "Teaching of English". A learning performance test was prepared to assess the student teachers' performance in "Teaching of English" at pre-, mid and post-test. To study changes in the teacher cognitions, existing instruments were adopted: the intrinsic motivation scale (Ryan & Deci, 2000), a metacognitive awareness scale (Schraw & Dennison, 1994), and a teacher self-efficacy scale (Schwarzer, & Jerusalem, 1995). To develop a richer picture of student experiences in the RPT setting, open-ended answers were obtained from the student teachers that participated in RPT in the experimental conditions.

Data were analysed by applying descriptive statistics and repeated measures ANOVA to understand the differential impact of RPT on student teachers learning performance and the interaction due to changes in the mediating variables. The qualitative data, collected on the base of the open-ended written answers were analysed by applying thematic analysis.

Chapter 6: General discussion and conclusions

The last chapter of the dissertation deals with the General Discussion and Conclusions. We discuss a summary of the main findings in line with the specific research questions. Further, the discussion focuses on the implication of the findings in terms of theoretical contributions, methodological insights, practical implications and policy advice. There are instructions and guidelines for policy makers, curriculum developers, and heads of

educational institutions in Pakistan.

Next, we present a series of limitations of the study that give way to ideas for future research directions in the ITE field. Again, these directions reiterate methodological but also theoretical directions for future research that drive thinking about how and why teacher cognitions are associated with the (non) adoption of didactical strategies. Also, the conceptual position of didactical strategies is discussed by emphasising the holistic nature of teacher behaviour and its development in ITE.

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2

Secondary school teachers' adoption of didactical strategies and its interrelation with teacher cognitions

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Chapter 2

Secondary school teachers' adoption of didactical strategies and its interrelation with teacher cognitions

Abstract

The present study explores the adoption of didactical strategies in Pakistan and how it is linked to secondary school teachers' cognitions level; i.e. teachers' Pedagogical Beliefs and Self-Efficacy Beliefs. In the current study, we involve 395 secondary school teachers from twenty government secondary schools across the largest province of Pakistan. Respondents reported their adoption of didactical strategies, 'Pedagogical Beliefs, and 'Self-Efficacy Beliefs about teaching' on instruments. The study aimed at describing and explaining the adoption of didactical strategies by linking it to secondary school teachers' cognitions. In relation to the didactical strategies adoption, Constructivist Beliefs, Traditional Beliefs, instructional Self-Efficacy, decision-making Self-Efficacy, and disciplinary Self-Efficacy were linked with didactical strategies. Our findings suggest that: (1) there is generally lower level adoption of varying didactical strategies by secondary school teachers; (2) there is a notable theory-practice gap in the actual classrooms (3) specific teacher cognitions are meaningfully connected with the adoption of didactical strategies. Implications are put forward as to a benchmark-driven professional development policy for secondary school teachers and the establishment of quality monitoring systems in schools.

Keywords: secondary school teachers, didactical strategies, pedagogical beliefs, self-efficacy beliefs

Introduction

Pakistan, one of the South Asian developing countries is facing real challenges in term of didactical strategies improvement and implementation of student-centred approaches by secondary school teachers (Khalid & Khan 2006; Memon, 2007). The quality of schools is

based on the personal attributes, Teaching Beliefs, and quality of a teacher. Teacher preparation courses in Pakistan to a large extent have failed in the professional development of novice and in-service secondary school teachers (Kanu, 2005). Research stresses that the vast majority of secondary school teachers in Pakistan are not able to implement what they learnt during teacher training in their daily practice (Sawada & Lokshin, 2009). Studies indicate that Pakistan secondary school teachers rather adopt traditional methods of teaching (Andrabi et al., 2013). Several studies reveal that secondary school teachers in Pakistan encounter hurdles from school administration and colleagues, resulting in a poor adoption of didactical strategies. This unfriendly environment also lowers Teaching Beliefs and Self-Efficacy Beliefs of secondary school teachers (Khamis & Sammons, 2004).

The low-level adoption of didactical strategies is not only observed in Pakistan but also a characteristic in many developing countries. Secondary school teachers' weak adoption of didactical approaches has gained worldwide importance and has become an issue of the global debate. In relation to this, authors also study teachers' Teaching Beliefs and their Self-Efficacy Beliefs. These are considered important indicators in view of the adoption of innovative didactical strategies (Walkington, 2005). In this regards Thomas (2013) studied the Teaching Beliefs of secondary school teachers and revealed that a majority of Pakistan teachers do not reflect Teaching Beliefs associated with the student-centred didactical approaches. Researchers point at the potential negative impact by stating that conventional and teacher-centred approaches might not be able to tap the potential of learners in the teaching-learning environment (Westbrook et al., 2009).

The latter introduces the main research problem: To what extent do teachers adopt a range of didactical strategies? In the present study, we, therefore, map the wide range adoption of these didactical strategies and try explaining their relationship with secondary school teachers' cognitions.

Theoretical framework

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The following Figure 1 represents the conceptual framework and hypothetical interrelationship between the adoption of didactical strategies and to critical teacher cognitions: teachers Self-Efficacy Beliefs and teachers Pedagogical Beliefs.

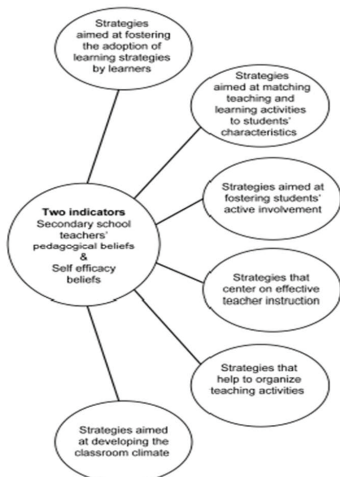


Figure 2. The conceptual and theoretical relationship of didactical strategies with teacher cognitions

Didactical strategies

Didactical strategies are defined as ‘teaching approaches where teachers use higher order questioning and pupils active contributions are valued’ as they test their understanding against collective meaning (Jones & Tanner, 2002). It is obvious that teachers adopt and implement different didactical strategies in the classroom in view of the attainment of particular learning objectives (Darling-Hammond, 2006).

Didactical strategies can be characterised in different ways. Some researchers indicate two types: traditional and constructive didactical strategies; hence illustrating one as student-oriented and the other as a teacher-oriented didactical strategies (e.g., Hermans et al., 2008). Constructivist strategies are based on student knowledge sharing, working in groups for better learning and understanding, providing a solution to learning problems, creating healthy and competitive classroom environment, etc. A traditional strategy refers to teacher-centred didactical approaches, disciplined classrooms, controlled environment, and content-based learning.

Authors such as, Van de Grift (2007) have proposed a substitute typology and go beyond the somewhat ideology-driven dichotomy between teacher-centred and student-centred approaches while putting forward didactical strategies that are basic to the classroom

teaching. Since we build on this typology in the current study, we add some examples to position clearly each typical strategy:

- activate the adoption of learning strategies by learners: pushing learners to adopt self-reflection, to raise their metacognitive awareness, to develop critical thinking, or to adopt problem-solving strategies
- strategies to match the teaching and learning activities to student characteristics: this includes strategies to cater for learning difficulties, socio-economic status differences, differences in language background, or inclusive education
- strategies to make students actively involved: these strategies push learners to be active, to be engaged, to get involved, to take initiative, to be active processors of information
- strategies that centre on effective teacher instructions: strategies that focus teaching on clearly stated learning objectives, or that make all learning content transparent
- strategies that help to organise the teaching activities: strategies that help developing a healthy classroom management, develop effective classroom directions, or apply effective time management procedures
- strategies to develop the classroom climate: strategies to develop a good learner-teacher relationship, to promote a stress-free classroom situation

Next to the lack of focus on the adoption of evidence-based didactical strategies and focus on a strategies typology, authors also refer to the lack of congruency between the adoption of these strategies and related teacher cognitions.

Lack of congruency

Subsequent to the absence in the variety of didactical strategies adoption, some authors indicate the nonexistence of the interrelationship of these didactical approaches and teacher cognitions (see, e.g., Johnston et al., 1985). Authors suggests that congruency is fundamental to theoretical notions about the enhancement of teachers' self-image and the change in the Professional Identity (Korthagen, 2005). According to Pennycook (2005) and Luke et al., (2005) teachers adopt particular didactical strategies when considering them the most appropriate and relevant. Korthagen (2004) introduces the basic theme while putting forward some levels to be considered essential for diversity in teaching and teachers. His

onion model stresses the need for alignment between the five levels. The onion model also infers that teachers' self-image, self-perception and self-esteem are fundamental components for teachers' professional identity. Teachers identity replicates their cognitions that is connected to teachers' behaviour (Korthagen, 2005).

The literature suggests that changing the behaviour of individuals has never been an easy task rather it encounters serious resistance from the individuals (Ellström 2010; Luke et al. 2005; Perkins et al., 2012).

Teachers' cognitions are of a paramount importance and should be considered while adopting the didactical strategies. The current study focuses on particular secondary school teachers' cognitions that drive didactical strategy adoption of teachers: Self-Efficacy Beliefs and Pedagogical Beliefs.

Teachers' pedagogical beliefs

Everyone holds certain beliefs in life. Also, teachers have specific beliefs about teaching learning process, regarding students' abilities, about one potential of teaching, etc. Beliefs have been really a messy concept to be explained in a clear way. Nisbett and Ross (1980) define beliefs as "reasonably explicit 'proportions' about the characteristics of objects and object classes" (p. 28). Beliefs are subjective and qualitative in nature and cannot be measured at existing knowledge measuring criteria hence; these are not the outer but inner ideas of individuals regarding various phenomena such as the teaching mechanism that includes beliefs regarding teaching methodology, classroom management, etc. (Calderhead, 1996). Pajares (1992) considers beliefs as changeable phenomena particularly when a teacher feels dissatisfied with the existing beliefs and come across with a reasonable substitute then he/she can adopt the most suitable ones. Teachers' pedagogical beliefs are actually the predictors of the individual's planning, adoption and implementation of didactical strategies (Lavigne, 2014).

Valcke et al., (2010) consider pedagogical beliefs as the supreme valued set of individual attributes that forms the teachers teaching approaches. They suggest that the strongest pedagogical beliefs would enable the teachers to formulate the didactical strategies in the most meaningful result oriented way. Pedagogical beliefs -as authors argued -are associated with diverse sections of instruction and knowledge (Beijaard et al., 2000; Korthagen, 2004).

In the literature, there is always division (traditional vs. constructivist) of these pedagogical beliefs (Hermans et al., 2008; Petko, 2012). Traditional beliefs are those beliefs where teacher considers himself/herself an authority on knowledge and total learning phenomena and the constructivist beliefs refers to the didactical approach where student is the centre of focus of all activities (Woolley et al., 2004). Literature in the Pakistan context suggests that secondary school teachers rather adopt traditional teaching beliefs that can be linked to traditional teaching (Khalid & Khan, 2006).

Teachers self-efficacy beliefs

Bandura (1977 & 1997) defines self-efficacy as the personal judgement of ones capabilities to organise and execute courses of actions that are necessary to achieve the goals. It is believed that Self-Efficacy Beliefs are interrelated with individual's life-time experience and that they are flexible and can change with the passage of time (Bandura, 1997) . These beliefs can forecast the future tendency and ability of an individual to compact with the most complicated situations (Bandura, 1977). Authors believe that these beliefs are the most powerful sources of intrinsic motivation for a person to perform the assigned tasks with great enthusiasm (Bandura, 1977). Researchers have revealed that these beliefs are outcome oriented such as students' performance in a particular subject, school performance or job satisfaction of an individual (Tschannen-Moran et al., 1998). Authors argue that these beliefs are of vital importance since they are interconnected with the improved teaching. Self-Efficacy Beliefs also enable teachers to choose and implement the desired didactical strategies for better learning (Lee et al., 2013). The adoption and implementation of didactical strategies mostly depends upon pedagogical beliefs and self-efficacy beliefs. Literature reveals that these beliefs motivate the individual's competences for the successful execution of didactical strategies (Jungert & Rosander 2010; Klassen & Tze, 2014). Different studies have shown that high self-efficacious teachers' didactical strategies are aligned with students personal interest, IQ level and learning attitude (Ferla et al., 2009; Guskey, 1988). Authors have suggested that that lower level of having self-efficacy beliefs the poorer level of adoption and implementation of varying types of didactical strategies (Barnes, 2000; Tschannen-Moran & Hoy 2007; Zimmerman, 2000).

Interrelationship of teachers' cognitions and didactical strategies

The purpose of the study is to link teachers' cognitions with the didactical strategies adoption. To our knowledge, hardly research is available studying this link; in particular in the Pakistan secondary school context. The present study is an attempt linking teachers' cognitions (pedagogical and self-efficacy beliefs) with the didactical strategies adoption.

Keeping in view the review of the related literature, we centre our study in Pakistan context and put forward the following research questions:

- a) What is the current state of the art in terms of the didactical strategies adoption by secondary school teachers in Pakistan?
- b) How are secondary school teachers' self-efficacy and pedagogical beliefs related to their adoption of didactical strategies?

Methodology

Research instruments

For the data collection purpose, we administered three instruments to the secondary school teachers. We carried out-for each instrument-a reliability analysis.

To record respondents' Pedagogical Beliefs, we adopted the instrument of Woolley et al., (2004) and administered. The instrument carried 34 statements together with the two subscales (traditional and constructivist beliefs). Respondents were given option to indicate their opinion regarding agreement or disagreement on a Liker scale ranging from 1 (strongly disagree) to 5 (strongly agree). Following is the detailed explanation of the both subscales, hence reporting the calculated reliability of items:

Traditional teaching beliefs (7 items, $\alpha = .70$); e.g.,

"I teach students all necessary content and skills; I follow a textbook or workbook".

"I am a firm believer in paper-and-pencil tests".

Constructivist teaching beliefs (9 items, $\alpha = .74$); e.g.,

"I often create thematic units based on the students' interests and ideas".

"I believe that expanding on students' ideas is an effective way to build curriculum".

The overall reliability of the scale is high ($\alpha = .91$). Confirmatory factor analysis indicates a good model fit: CFI= .946, aGFI = .940 and RMSEA= .055.

Teacher Self-Efficacy was determined with the scale of Bandura (1977). This instrument of Self-efficacy consists of 28 statements, clustered along 6 subscales. Only subscales that are linked to didactical strategies were retained in the current version of the instrument. We excluded items related to the following subscales: parental involvement, community involvement, and positive school climate. Following is the detailed explanation of the 6 subscales, hence reporting the calculated reliability of items:

Decision-making Self-Efficacy (3 items, $\alpha = .72$); e.g.,
 "I influence the decisions that are made in the institute".
 "I get the instructional material and equipment that I need".

Instructional Self-Efficacy (8 items, $\alpha = .78$); e.g.,
 "I get students to do their homework".
 "I get through to the most difficult students".

Disciplinary Self-Efficacy (3 items, $\alpha = .74$); e.g.,
 "I get students to follow classroom rules".
 "I prevent problem behaviour on the school ground".

As per the reliability purpose, we did not change the original reporting scores (0-100) into the Likert Scale (1-5) that we adopted for other two instruments in our study. So every respondent gave his/her opinion on the numbered table from 0-100 while reporting the level of assurance for the completion of a specific task. We observe pretty high internal consistency for the entire instrument ($\alpha = .91$). Confirmatory factor analysis (CFA) of the scale also indicates a good model fit: CFI = .938, aGFI = .912 and RMSEA = .068.

For the didactical strategies, the validated instrument of Van de Grift (2007) was used to measure secondary school teachers' current didactical strategies adoption. These authors conducted a cross-sectional study in seven European countries in order to observe didactical skills. Respondents were given option to indicate their opinion regarding agreement or disagreement on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Following is the detailed explanation of the both subscales, hence reporting the calculated reliability of items:

Strategies that foster the adoption of learning strategies by learners (9 items, $\alpha = .88$); e.g.,

“I encourage students to think aloud”.

“I promote the application of what has been learned”.

Strategies to match the teaching and learning activities to student characteristics (3 items, $\alpha = .70$); e.g.,

“I bridge the differences between learners and what they are expected to learn”.

“I encourage self-confidence in students”.

Strategies to make students actively engaged (4 items, $\alpha = .76$); e.g.,

“I promote that students do their best”.

“I use instructional strategies that activate students”.

Strategies that centre on good teacher instruction (7 items, $\alpha = .83$); e.g.,

“I provide feedback to the students”.

“I check whether the lesson objectives were attained.”

Strategies that help to organise the teaching activities (4 items, $\alpha = .81$); e.g.,

“I ensure that the lesson is conducted in an orderly way”.

“I check – during activities - whether students performed the tasks in a proper way”.

Strategies to develop the classroom climate (4 items, $\alpha = .84$); e.g.,

“I promote mutual respect among students”.

“I show respect to the students through his/her behaviour and language”.

We observe very high reliability of the whole scale ($\alpha = .95$). To estimate the validity of the instrument, we made confirmatory factor analysis (CFA). The results of CFA shows an acceptable model fit: CFI = .973, aGFI = .907 and RMSEA = .087.

Participants

The study was set up in twenty secondary schools in the Punjab province of Pakistan.

Through the convenient sampling, we selected 20 secondary schools in Muzaffargarh district of Punjab province. In view of the study, permission was obtained of the respective Headmasters/Headmistresses of each secondary school. All teachers – present at the moment of the study in the 20 schools – were invited to participate. Respondents were aged between 25-50 years; 82% of them were male. The sample included teachers teaching all subjects, science, arts, languages, and social sciences. All respondents received a letter about the nature of the study and signed the letter in view of informed consent.

Analysis approach

We analysed the validity of the instrument with structural equation modelling (SEM) Amos 7.0 (Arbuckle, 2006). To answer the first research question, we made descriptive analysis of the data by calculating; mean scores, standard deviations, one-sample *t*-test and Cohen *d* effect size. The particular focus was given on the analysis of one-sample *t*-test for the further calculations of Cohen's *d* effect size to match the didactical strategies adoption results with the benchmarks. Available teacher competency standard lists (see, e.g., Bartlett, 1992; Hager & Butler, 1996) stress the high level of adoption of didactical strategies. This implies a high-pitched mastery level. This is in line with the Mastery Learning literature. Authors suggest that a minimum score of 80% should be stressed to judge the mastery on a particular educational task (Bartlett, 1992). We made regression analysis to answer our second research question that was based on exploring the relationship of didactical strategies with teachers' cognitions. All related analyses were carried out with SPSS version 19 (Nurosis, 1993).

Descriptive results

To explain the descriptive results, *Mean*, *SD*, one sample *t*-test and Cohen's' *d* effect size were calculated. The table 1 (Appendix) shows the descriptive results in details.

< Please insert Table 1 around here >

The table reflects less advanced or less candid secondary school teachers teaching beliefs (see especially disciplinary Self-Efficacy Beliefs ($n=395$, $M=13.13$, $SD=2.79$). In the same way, we also observe weaker levels in instructional Self-Efficacy Beliefs ($n=395$, $M=13.48$, $SD=2.29$). As to the teachers' teaching beliefs, secondary school teachers scored almost equal on both Traditional ($n=395$, $M=14.83$, $SD=2.04$) and Constructivist Pedagogical Beliefs

($n=395$, $M=14.32$, $SD=2.34$).

In the table 1, we also observe an over low-level didactical strategies adoption by the secondary school teachers.

To what extent secondary school teachers adopted the didactical strategies (DS)?

Table 1 represents the results to address the first research question and shows the values that indicate the levels of didactical strategies adoption by the respondents.

One-sample *t-test* results in the Table 1 present a clear picture of an overall low-level didactical strategies adoption by secondary school teachers. When compare to the standard, all these results are below the benchmark. Considering the effect size results, we notice medium ($d > .5$) to large effect sizes ($d < .1.0$) in the adoption of all types of didactical strategies.

To what extent teachers' cognitions are interrelated with the adoption of didactical strategies?

In response to the second research question, we studied the relationship between secondary school teachers' cognitions and their didactical strategy adoption. For this purpose, we studied six consecutive linear regression models; checking to what extent Constructivist/Traditional Pedagogical Beliefs and the Self-Efficacy Beliefs are associated with the adoption of a specific type of didactical strategies (DS type). Table 2 (Appendix) summarises the related results.

< Please insert Table 2 around here >

In Table 2, the regression results indicate the relationship between the didactical strategies adoption and certain teachers' cognitions. In the first model, results regarding DS type "*strategies that activate the adoption of learning strategies by learners*" indicate that there is a correlation between the didactical strategies adoption and three teachers' cognitions. Overall 36,7% of the variance ($F_{(13,381)}=18,49$; $\alpha R^2= .36,7$, $p < .01$) is explained by four indicators i.e., Constructive Beliefs, Traditional Beliefs, decision-making Self-Efficacy Beliefs, and disciplinary Self-Efficacy Beliefs. The regression coefficients (β) results indicate that when there is an increase in Constructivist Beliefs by one unit, there is also an increase of .133 in the activation of this DS adoption. The increase is also observed when the

Traditional Beliefs increase with one unit (increase of .190 units); similarly when decision making Self-Efficacy Beliefs increase with one unit, DS type increase with .089 units and also when disciplinary Self-Efficacy Beliefs increase with one unit, there is an increase of .146 units in DS type adoption.

In the second model, results regarding the DS type *“strategies to match the teaching and learning activities to student characteristics”* indicate that three teacher cognitions are linked with this DS type adoption. Overall 32,4% of the variance ($F_{(13,381)}=15,54$; $aR^2= .32,4$, $p<. 01$) is explained by traditional Pedagogical Beliefs, instructional Self-Efficacy Beliefs and disciplinary Self-Efficacy Beliefs. The regression coefficients (β) results indicate that when there is an increase with one unit in the score for traditional pedagogical beliefs, there is also an increase of .207 units in the adoption of strategies that match student characteristics. Similarly, an increase with one unit in instructional Self-Efficacy Beliefs goes together with an increase with .312 units in DS type adoption; also an increase with one unit in disciplinary Self-Efficacy results in an increase with .183 units in DS type adoption.

In the third model, results regarding the adoption of DS type *“strategies to make students actively involved”*, indicate that two teacher cognitions positively contribute and explain 18,5% of the variance ($F_{(13,381)}=7,85$; $aR^2= .18,5$, $p<. 01$). The regression coefficients (β) results indicate that an increase with one unit in the score for Constructivist Beliefs goes together with an increase of .168 units in the DS type adoption. Also, an increase with one unit in disciplinary Self-Efficacy Beliefs results in an increase with .156 units in DS type adoption.

The fourth model explains the results and reveals that three teacher cognitions are positively correlated with the DS type *“strategies that centre on effective teacher instructions”*. Overall 26,1% of the variance ($F_{(13,381)}=11,22$; $aR^2=.26,1$, $p < .01$) is explained by Decision making Self-Efficacy Beliefs, instructional Self-Efficacy Beliefs and disciplinary Self-Efficacy Beliefs. The regression coefficients (β) results indicate that when there is one unit increase in Self-Efficacy Beliefs, there is also an increase of .092 units in DS type adoption; the same increase in Self-Efficacy Beliefs is linked with an increase of .143 units in DS type adoption, and similarly an increase in disciplinary Self-Efficacy Beliefs with one unit result in an increase of .113 units in DS type adoption.

The results in the fifth model shows that two teacher cognitions are significantly associated with the DS type *“strategies that help to organise the teaching activities”*. Overall 24,1% of the variance ($F_{(13,381)}=10,62$; $\alpha R^2=.24,1$, $p < .01$) is explained by the Constructive Beliefs and decision making Self-Efficacy Beliefs . The regression coefficients (β) results indicate that when there is an increase by one unit in Constructivist Beliefs, we also observe an increase of .183 in this DS type adoption. The latter is also observed when decision-making Self-Efficacy Beliefs increases with one unit, an increase of .161 units is observed in DS type adoption.

Lastly, the regression results in the sixth model explain that two teacher cognitions are correlated with the DS type *“strategies to develop positive classroom climate”*. Instructional Self-Efficacy Beliefs and disciplinary Self-Efficacy Beliefs explains 18,0% of the variance ($F_{(13,381)}=7,63$; $\alpha R^2=. 18$ $p < .01$). The regression coefficients (β) results indicate that an increase by one unit in Self-Efficacy Beliefs goes together with an increase of .240 in this type of DS adoption. Similarly, when the disciplinary Self-Efficacy Beliefs increases with one unit, there is an increase of .199 units in DS type adoption.

Discussion

The present study focused on (1) the exploration of the current state of the art as to the adoption of types of didactical strategies by secondary school teachers in Pakistan, and (2) the relationship between didactical strategies adoption with teachers’ cognitions. With respect to the first research question, a very low-level adoption of all didactical strategies was observed. This adoption is significantly below the benchmark. The present study was based in the most developed and largest province of Pakistan where half of the country’s population is dwelling, and the literacy rate is higher than the other provinces of the country (Barrs, 2005). The lower results in this province can predict the situation in other provinces. These results confirm the findings of the study of Iqbal and Shayer (2000), also set up in Pakistan secondary schools’ analysis of the didactical strategies being studied. But the same is often observed in developed countries; see the study of Bolinger and Warren (2007) and Niemi (2002) in Finland.

Hunzai (2009) links this less positive situation to the theory-practice gap that results from professional development and teacher education settings. Other authors link the weak

adoption to the weak teacher motivation that results from and low-level incentives for teachers in the Pakistan educational system (Halai, 2006). There is clear evidence that teaching is a low-paid profession in the country and not many talented people select this profession by choice (Kanu, 2005).

Valcke et al., (2010) and Maulana et al., (2011) stress that adoption of didactical strategies depends on the planning approach of teachers. More in particular, research revealed how adopting a pre-planned lesson approach resulted in a richer variety of didactical strategies used by teachers. Others refer to the role of professional development to influence in-service teachers in view of more adequate didactical strategy adoption (Khattak, 2012). In the Pakistan context, the lack of in-service professional development facilities is a considerable factor that does not motivate teachers to adopt a wider variety of didactical strategies (Halai, 2006). Various initiatives have been taken to handle this problem by providing in-service teachers training programmes. For instance, the Directorate of Staff Development (DSD) in Punjab province has launched programme for the adoption of didactical strategies among school teachers with the core objective of quality teaching in schools (Zareen et al., 2013). Thus far, we did not pick up the impact of these training approaches in the current study. Certain authors find explanations for the weak adoption of didactical strategies in the pervasiveness of rote learning in schools (Bataineh, 2009). The culture of memorization and rote learning has negative effects on overall secondary school education in Pakistan since it pushes the adoption of single-sided teacher-centred didactical strategies (Kanu, 2005). Our results are not completely in line with available research in Pakistan. A study conducted in Karachi (the financial capital in Pakistan), concluded that secondary school teachers adopted to a high extent didactical strategies to cater for individual learner characteristics (Ghouri et al., 2010). This can partly be explained by looking at the demographics of their study and the present study.

The situation can also be linked to a weak macro-level quality assurance perspective. First, Pakistan has – yet – not adopted a continuous quality control system to link the attainment of learning objectives in secondary school education in Pakistan to effective teacher instruction approaches (Osakwe, 2014). In addition, there is no quality assurance and teacher assessment approach that is positioned on teacher performance (Khan, 2013). Nevertheless, changes are under way. Promising steps have been taken to address the issue

of teacher assessment, building on the National Assessment System (NAS) and the National Educational Assessment System (NEAS). Both are expected to give way to benchmarking and following up changes in teachers' performance (Khattak, 2012).

Pedagogical beliefs are of paramount importance in teaching-learning system, but not much is discussed in secondary school teachers' context. Little research is available linking teachers' cognitions to the didactical strategies adoption. The empirical findings of the current study underpin a significant linkage between teachers' teaching beliefs (constructive and traditional) and the adoption of didactical strategies. Literature suggests that there is a positive relationship in teaching beliefs and didactical strategies, thus the higher teaching beliefs, the result-oriented and successful adoption of didactical strategies (Borg, 2011; Isikoglu et al., 2009; Symeonidou & Phtiaka, 2009). This reemphasizes the theoretical framework that sees pedagogical beliefs as a base for implementing types of didactical strategies in the day to day learning situations (Kagan, 1992; Nespor, 1987; Pajares, 1992). In the current study, Self-Efficacy Beliefs were also significantly linked to didactical strategies adoption. This is in line with the study of Woolfolk et al., (1990) who found a very strong relationship. The literature stresses that higher self-efficacious teachers are more successful in their teaching than teachers with low Self-Efficacy Beliefs. This relationship is also reflected in the study of Brouwers and Tomic (2000) who involved 243 Dutch secondary school teachers and found a positive relationship between Self-Efficacy Beliefs and the adoption of effective classroom management strategies.

Implications

The present current study put forward substantial implications for the in-service teachers in the secondary school system of Pakistan. First, the results suggest there is a dire need for implementing high standard professional development programmes for the in-service teachers in Pakistan. There is also a need for monitoring the didactical approaches of Pakistan secondary school teachers. In both contexts, the definition of clear standards and benchmarks would be helpful to point at critical strengths and weaknesses. Additionally, the results can inspire curriculum developers to upgrade didactical support materials; and push policy makers and school principals to join hands in developing a professional school community to rethink the school-learning environment. Taking into account the findings regarding the impact of teachers' cognitions, it is suggested that policy planning, curriculum

development and teachers training must be given due weightage to address the importance and nature of these cognitions. Experiences, such as the approach of Chan (2008) reflect that secondary school teachers' cognitions can be developed by extensive in-service professional development programmes. These programmes should cater for the bridging of theory-practice gaps in the schools and eventually in the real classroom settings.

The current study reflects limitations as we only focused on survey studies. Together with the quantitative study, a qualitative approach would also enrich the results for the secondary school teachers. Future researchers may also include policy makers, curriculum developers, and head teachers in the future studies analysing their approach toward the adoption of didactical strategies.

Conclusion

In the present study, the sole focus is on the secondary school teachers' didactical strategies adoption and how the latter is associated with the secondary school teachers' cognitions. The findings reconfirm the importance of teachers' cognitions in the educational context. The results point at the critical situation in Pakistan secondary education when it comes to the types of didactical strategies being adopted. Though the results can be explained by the developing context of the country, clear implications can be put forward that stresses the need for a dynamic policy move towards quality assurance and benchmark-driven professional development.

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AppendicesTable 1. Results of Mean, SD, one-sample *t*-test and effect size *d* (N=395)

Variables	M	SD	<i>t</i>	<i>d</i>
Traditional beliefs	14.83	2.04		
Constructivist beliefs	14.32	2.34		
Self-efficacy				
Decision making Self-efficacy	13.58	3.12		
Instructional Self-efficacy	13.48	2.29		
Disciplinary Self-efficacy	13.13	2.79		
Didactical strategies				
To activate the adoption of learning	14.09	2.45	8.88**	0.89
To match to student characteristics	14.39	3.16	8.78**	0.88
To make students actively engaged	13.92	2.98	6.15**	0.65
To center on effective teaching	14.14	2.38	9.57**	0.96
To organize teaching activities	14.03	3.13	6.58**	0.66
To develop positive class climate	14.11	3.03	7.30**	0.73

* $p < .05$, ** $p < .01$

Table 2. Overview of the regression results for the six models with teaching beliefs and self-efficacy as predictor variables

*Dependent variable to activate adoption of learning strategies, $F_{(13,381)} = 18,49$; $aR^2 = .36,7^{**}$ ($N=395$)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	-2.51	1.25		-2.00
Constructive Beliefs	.133	.060	.127	2.19*
Traditional Beliefs	.190	.075	.158	2.55*
Decision making SE	.089	.040	.113	2.20*
Disciplinary SE	.146	.045	.166	3.20**

*Dependent variable to match to student characteristics $F_{(13,381)} = 15,54$; $aR^2 = .32,4^{**}$ ($N=395$)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	-3.71	1.66		-2.22
Traditional Beliefs	.207	.099	.134	2.08*
Instructional SE	.312	.081	.227	3.84**
Disciplinary SE	.183	.060	.162	3.04**

*Dependent variable to make students actively engaged $F_{(13,381)} = 7,85$; $aR^2 = .18,5^{**}$ ($N=395$)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	1.30	1.72		.758
Constructive Beliefs	.168	.083	.132	2.02*
Disciplinary SE	.156	.071	.154	2.21*

*Dependent variable to center on good teaching $F_{(13,381)} = 11,22$; $aR^2 = .26,1^{**}$ ($N=395$)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	3.28	1.31		2.49
Constructive Beliefs	.092	.042	.120	2.18*
Traditional Beliefs	.143	.064	.138	2.24*
Instructional SE	.113	.048	.132	2.37*

*Dependent variable to organize teaching $F_{(13,381)} = 10,62$; $aR^2 = .24,1^{**}$ ($N=395$)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
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Chapter 2

1 (Constant)	1.28	1.74		.736
Constructive Beliefs	.183	.084	.137	2.17*
Decision making SE	.161	.056	.161	2.86*

Dependent variable: to develop positive classroom climate $F_{(13,381)} = 7,63$; $aR^2 = .18,0^{**}$ (N=395)

Model	B	SE	Beta	t
1 (Constant)	11.35	1.76		6.45
Instructional SE	.240	.86	.182	2.79*
Disciplinary SE	.199	.64	.184	3.12*

aR^2 refers to the adjusted R^2

** P < .01; * p < .05

3

Exploring pre-service teachers’ adoption of didactical strategies and its relationship with student teachers’ pedagogical and self-efficacy beliefs

Based on:

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2016). The critical state of initial teacher education in Pakistan: Need for urgent reforms. *PONTE*, 72(4), 216–236.

Chapter 3

Exploring student teachers' adoption of didactical strategies and its relationship with student teachers' pedagogical and self-efficacy beliefs

Abstract

The current research study investigates the perceived adoption of didactical strategies and how this adoption is related to student teachers' cognitions; i.e. student teachers' pedagogical beliefs and self-efficacy beliefs in the initial teacher education setting in Pakistan. A sample of 250 student teachers enrolled in Masters in Education (M.Ed) from two largest universities of Pakistan participated in the study. The respondents filled out three survey instruments related to their perceived adoption of didactical strategies, pedagogical beliefs, and self-efficacy beliefs. The main findings of the study includes (i) an overall weak adoption of the different types of didactical strategies by student teachers, and (ii) a significant positive relationship found in the perceived adoption of didactical strategies with student teachers' cognitions, i.e., teaching self-efficacy beliefs and pedagogical beliefs. The results suggest a critical need for the continuous professional development of teacher educators in ITE institutes in Pakistan. Also, there are clear recommendations for the curriculum developers and educational policy makers to put forward benchmarking exercises on regular basis.

Keywords: initial teacher education, student teachers, didactical strategies, pedagogical beliefs, and self-efficacy beliefs

Introduction

Apart from the other reasons of educational decline in the country, teacher induction in the teaching profession is not based on clear standards (Lynd, 2007). These standards are central to improve the quality of teacher education (Chan, Tan, & Khoo, 2007). In Pakistan,

teacher education is facing challenges in terms of policy making, curriculum design, and lack of teacher professional development opportunities (Ali, 2011). Factors contributing to the deterioration of teacher education include the low budget for education, the lack of infrastructure at all levels of education - particularly at higher education student teacher training level - and a lack of focus on transferable skills in initial teacher education (ITE) programs (Khamis & Sammons, 2004).

Pakistan research points out that ITE programmes develop future teachers in a rather traditional way. Though they push future teachers to adopt – at a theoretical level - innovative teaching and learning approaches, the teacher education model itself is not congruent with this innovation message (Khattak, Abbasi, & Ahmad, 2011). Next to a subject-centred rigid curriculum, we observe adherence to ill-defined educational philosophies and theories, resulting in the adoption of the lecture method without an active involvement of students (Ali, 2011). According to the latter author, a student-centred approach is absent in the curriculum or teaching education approach. Critical is the central evaluation tradition in different ITE institutions, which mainly (80%) builds on open theory-oriented questions (Khamis & Sammons, 2004). However, in the ITE curriculum (see the handbooks), there is a large emphasis on the use of innovative teaching strategies i.e. peer tutoring, collaborative learning and group work, but in actual ITE practice, student teachers are not exposed to these strategies (Tahir & Taylor, 2013). A teacher-centred approach dictates the course content to students for the sake of rote learning and memorization, to be reproduced during examinations. This is detrimental to students' motivation, neglects their 'innovative abilities' and reduces their critical thinking (Westbrook et al., 2009). Student teachers wanting to apply theoretical knowledge in the classroom meet hurdles such as bureaucratic limitations (e.g. time tables), a non-cooperative attitude of senior teachers, a rigid and overloaded curriculum, and the emphasis on what has to be studied in view of the central exam (Kanu, 2005).

Literature shows that this problem can be linked to the international debate about the nature and quality of ITE (Darling-Hammond et al., 2005). In this respect, research points at the theory-practice gap; the lack of actual adoption of what has been learned in the real classroom situation, the lack of adoption of student-centred teaching and learning approaches in the teacher education institutions. To tackle these problems, 'models' have

been put forward to redirect initial teacher training and professional development of teachers (Darling-Hammond, 2000). Early models - e.g., the model of Joyce and Weil (1980) - focus on prescriptions about the planning, execution, and evaluation of lessons. Though successful in the teacher education setting, these models have been heavily criticised. They were considered to do insufficient justice to the reality and complexity of teaching practice (Beijaard & Vries, 1997). Alternative models introduced constructivist views about learning to teach, emphasising active involvement in teaching settings and learning from experiences (e.g., Zeichner, 1983). This constructivist view was expected to help student teachers developing consistent and adequate knowledge structures that progressively guide their actions in practice (e.g., (Bennett & Carré, 2002). Also, other frameworks emerged to inspire initial teacher education approaches. Of interest is the focus on student teachers 'frameworks' (Beijaard, Verloop, & Vermunt, 2000). These frameworks are not seen as prescriptions but rather as tools for student teachers to guide their personal perceptions; it remains their responsibility to make use of e.g. didactical strategies when they consider them aligned with their perception of the situation. These models emphasise 'reflection' on experiences and practice (Korthagen & Kessels, 1999). They put teacher cognitions at the centre of teacher education (e.g., beliefs, self-efficacy, perceptions, and attitudes). Also, they put these teacher cognitions at the centre of explaining the way teachers actually adopt particular teaching and learning practices.

The latter statement brings us to the key research problem tackled in this article: How is the adoption of varying types of didactical strategies related to teacher cognitions?

Conceptual and theoretical framework

Didactical strategies

Didactical strategies are the critical part of the typical decisions in view of a teaching activity that foster the active involvement of learners in a way that knowledge is being constructed, processed and stored (Darling-Hammond, 1996; Day, 1999). Didactical strategies are also labelled as teaching strategies, instructional strategies, or pedagogical approaches. A large variety of strategies can be adopted, varying from lecturing to group work, peer tutoring, demonstrations, lab work, field trips, etc. Some strategies rather refer to micro-level classroom actions by centring on the subject-specific learning objectives at hand; others

rather refer to systemic approaches that result in a consistent adoption of the strategy in a teaching and learning situation (e.g., peer tutoring or problem-based learning) or focus on conditions to guarantee the attainment of the learning objectives (e.g., focus on classroom management, active involvement, catering for learner differences). The latter is, in particular, in problem-based learning, case-based learning, and direct instruction, etc.

It is critical that student teachers learn to adopt a broad variety of didactical strategies, to be able to attain the varying learning goals (Day, 1999). In the literature, the nexus between the adoption of didactical strategies and the particular learning domain is stressed in another way. As stated earlier, teaching builds on the mastery of related Pedagogical Content Knowledge (PCK). The 'pedagogical' component refers to the choice for adequate strategies that fit the nature of the learning content to be processed (Shulman, 1987). PCK facilitates the teacher educator to bridge content knowledge and didactical strategies; it refers to knowledge-based didactical strategies (Shulman, 1999).

When it comes to the adoption of didactical strategies, three elements reappear in international discussions: (a) a lack of adoption of evidence-based didactical strategies, (b) a focus on a narrow band of types of didactical strategies and (c) the congruency discussion. Hattie (2009, 109-110) especially points at the lack of adoption of evidence-based strategies in teacher education that goes together with the narrow-band within strategies being adopted and the lack of adoption of these strategies by the teacher educators themselves. He criticizes the non-data-driven teacher education approaches. The latter is especially disconcerting considering the fact that student teachers are the future generations of teachers in schools should be able to adopt adequate (effective, efficient, satisfactory) didactical strategies (Hattie, 2009). Teacher training is expected to result in a transfer of the approaches modelled during the training into the classroom teaching practices (Korthagen, 2004; Shagrir, 2015; Visser, Stes, & Van Petegem, 2014).

In the literature, didactical strategies are discussed in varying ways. Some authors refer to constructivist versus traditional didactical strategies; thus reflecting a student-centred versus a teacher centred teaching approach (e.g., Day, 1999). Examples of 'constructivist' strategies would focus on ways to collaborative work, to share knowledge and solution strategies, to tackle complex problems, to invoke self-evaluation, to ask students to develop questions (Hobson & Morrison-Saunders, 2013). Traditional strategies comprise a focus on

teacher questions, focus on knowledge, focus on teacher-centred evaluation (Tormey & Henchy, 2008). Other authors propose an alternative typology. Van de Grift, (2007) for instance distinguishes between six types of instructional strategies. Since we build on this typology in the current study, we add some examples to position clearly each typical strategy:

- strategies that activate the adoption of learning strategies by learners: pushing learners to adopt self-reflection, to raise their metacognitive awareness, to develop critical thinking, or to adopt problem-solving strategies.
- strategies to match the teaching and learning activities to student characteristics: this includes strategies to cater for learning difficulties, socio-economic status differences, differences in language background, or inclusive education.
- strategies to make students actively involved: these strategies push learners to be active, to be engaged, to get involved, to take initiative, to be active processors of information.
- strategies that centre on effective teacher instructions: strategies that focus teaching on clearly stated learning objectives, or that make all learning content transparent.
- strategies that help to organise the teaching activities: strategies that help developing a healthy classroom management, develop effective classroom directions, or apply effective time management procedures.
- strategies to develop the classroom climate: strategies to develop a good learner-teacher relationship, to promote a stress-free classroom situation.

Next to the lack of focus on the adoption of evidence-based didactical strategies and focus on a strategies typology, authors also refer to the lack of congruency between the adoption of these strategies and related teacher cognitions. This 'congruency' or 'alignment' is central to theoretical conceptions about the development of a teacher's Professional Identity (Korthagen, Kessels, Koster, Lagerwerf, & Wubbels, 2001). According to Leikin (2006) and Loughran (2006) teachers only adopt self-regulation inducing didactical strategies if they believe in the autonomy and self-regulated nature of their learners. The onion model of Korthagen (2004) stresses in this context the layers of change in teachers. The model is widely acknowledged and adopted by teacher educators. It stresses the congruency between the layers 'behaviour, competence, beliefs, identity and mission' when a student

teacher functions in an environment. The model implies that changing the behavioural layer should be linked to congruent changes in competence and beliefs and fit the mission and identity of the student teacher. The model also implies that student teacher's professional identity is based on personal' self-actualization, self-recognition and self-perception as a teacher. Their identity reflects their cognitions as related to their behaviour (Korthagen et al., 2001).

Individuals are not always in favour of changing their behaviour and even resist when it is considered a threat to their self-image and identity (Nias, 1999). This helps explaining why student teachers do not readily adopt particular didactical strategies. Teacher education could introduce student teachers to a wide variety of didactical strategies and teacher educators could model their adoption. This basic experience is expected to influence the way student teacher think about these strategies. This is consistent with the view of (Beijaard, 1995) when it is stressed that initial teacher education/training should consider the full nature of a teacher's professional identity. Student teacher cognitions should be touched upon since they guide a person's actions (Meijer, Verloop, & Beijaard, 2002). In the present study, we centre of two particular student teacher cognitions, e.g., student teachers' pedagogical beliefs and self-efficacy beliefs.

Pedagogical beliefs

A belief is a representation of the information someone holds about an object, or a 'person's understanding of himself and his environment' (Fishbein & Ajzen, 1975, 131). Beliefs are as diverse as the instructional process itself (e.g., beliefs about inclusion, about diversity), knowledge (epistemological beliefs), teaching components (beliefs about teaching goals, beliefs about subject-matter what to be selected for teaching, beliefs about use of audio-visual aids, teaching strategies, evaluation process etc.), parents, school, instructional context and organizational context (Tondeur, Devos, Van Houtte, van Braak, & Valcke, 2009). As will be explained below, we centre in the present study on pedagogical beliefs that can be linked to the adoption of instructional strategies.

Pajares (1992) considers beliefs the most valuable set of personal characteristics forming teaching behaviour. Also, Valcke, Sang, Rots and Hermans (2010) stress the importance of pedagogical beliefs in view of a successful teacher education system. The latter suggests

that beliefs have a strong linkage with the actual adoption of didactical strategies. Pedagogical beliefs are related to various components of teaching and learning (Beijaard et al., 2000; Brownlee, 2001; Erdamar & Alpan, 2013; Korthagen et al., 2001). Often, researchers divide them into traditional and constructivist beliefs (Hermans, Tondeur, van Braak, & Valcke, 2008). Traditional beliefs are often recognised as teacher-centred beliefs, subject-oriented beliefs and theory-oriented beliefs (Woolley, Benjamin, & Woolley, 2004). Student teachers adopting traditional beliefs about teaching organise their didactical strategies in a well-structured and disciplined way. Constructivist beliefs are also known as student-centred beliefs, progressive beliefs and activity-oriented beliefs (Beijaard, 1995).

Self-efficacy beliefs

Bandura (1997) defines self-efficacy as 'beliefs in one's capacity' to organise and execute the course of action required to produce given attainments' (Bandura, 1997, p. 3). Self-efficacy beliefs are not static. Rather, they are active and changeable with time and experience of an individual (Bandura, 1997). Self-efficacy beliefs are successful predictors of behaviour, and they indicate that how will a person behave in a specifically given situation when having to deal with complex problems (Bandura, 1977). It is believed that self-efficacy is a motivational element in one's personality, which urges for the fulfilment of tasks with extreme vigour and zeal (Bandura, 1977). It is associated with the outcomes of a given task, students' performance in the class, personal job satisfaction and beliefs upon self-confidence (Tschannen-Moran, Hoy, & Hoy, 1998). Student teacher's self-efficacy beliefs are important in view of the development of effective didactical strategies (Walkington, 2005). The latter depend on particular cognitions - e.g., beliefs and self-efficacy - that activate personal capabilities in view of the implementation of didactical strategies (Walkington, 2005).

Student teachers in Pakistan initial teacher education institutions reflect a low Self-Efficacy Beliefs in teaching (Rizvi & Elliot, 2005). Studies have proved that low motivation leads towards low self-efficacy beliefs, resulting in a poor adoption of didactical strategies (Tschannen-Moran & Hoy, 2007).

Focus of the current study

In the current study, we link both student teacher cognitions 'self-efficacy' and 'pedagogical

beliefs' to the adoption of didactical strategies. Bandura (1977) and Rotter (1966) present the theoretical base as to the critical role of self-efficacy in general and self-efficacy in student teachers in particular. Student teachers with a high level of self-efficacy beliefs are expected adopting constructivist didactical strategies. The work of Bandura (1977) extends this concept from a cognitivist point of view. Guskey (1986 &1989) is of the opinion that high self-efficacy is linked with choosing more innovative didactical strategies. Didactical strategies are adopted in a classroom in an effective way if a student teacher possesses a high sense of self-efficacy. Student teachers with poor self-efficacy beliefs are less able adopting innovative didactical strategies to produce good learner performance (Bandura, 1997)

Methodology

Research questions

The available theoretical and empirical base brings us to the following research question, set in the Pakistan educational context: what is the nature of the student-teacher cognitions and how are they interrelated with didactical strategies. Answers to this research question will be informative to develop initial teacher education in Pakistan. Two research questions guide this study:

- What is the state-of-the-art as to the adoption of types of didactical strategies by student teachers in teacher education institutions in Pakistan?
- How are the student teachers' cognitions (Teaching Self-Efficacy and Pedagogical Beliefs) related to the adoption of types of didactical strategies?

Participants

The study was set up in two public teacher education institutes in the Punjab province of Pakistan. In this province, there are 75 public and 7 private teacher education institutes (Isani, 2001). Student teachers enrolled at the two largest teacher education institutes in the country i.e., Punjab University Lahore, and the Bahauddin Zakariya University Multan were involved in the study. All students – present at the moment of the study – were invited to participate (33% of a total number of students). Respondents were aged between 20-25 years; 76% of them were female. The sample included both first year ($n = 150$) and second-year master students ($n = 100$) enrolled in the Pakistan two-year teacher education

curriculum.

Procedure

The study was set up at the end of the academic year to allow for a sufficient level of awareness as to the adoption of the didactical strategies in the student teachers. In view of the study, permission was obtained from the university educational authorities and contacts were established before time for the purpose of data collection. Students were firstly contacted through their teachers who informed them about the research study. All respondents received a letter about the nature of the study in view of obtaining their informed consent.

Instruments

Three instruments were presented to the respondents. In relation to each instrument, next to a reliability analysis, also validity was studied on the base of confirmatory factor analysis. Benchmarks were derived from the literature to judge the model fit indices (Bentler & Bonett, 1980). In view of determining student Teacher's Pedagogical Beliefs related to teaching and learning, the instrument of Woolley et al., (2004) was adopted. This instrument consists of 16 statements, organised along two subscales. Respondents indicated – with a 5-point Likert scale - to what extent they agreed with the particular statement. For each subscale, we report the number of items and the reliability level (Cronbach's α) as calculated on the base of data collected in the present study:

Pedagogical beliefs

Traditional Pedagogical Beliefs (7 items, $\alpha = .72$):

- I base student grades primarily on homework, quizzes, and tests.
- I am a firm believer of the paper-and-pencil test.

Constructivist Pedagogical Beliefs (9 items, $\alpha = .70$):

- I prefer to cluster students' desks or use tables so they can work together.
- I invite students to create many of my bulletin boards.

Overall internal consistency of the scale ($\alpha = .84$). Confirmatory factor analysis reflects a good model fit: CFI = .946, aGFI = .940 and RMSEA = .055.

Self-efficacy

On the base of the scale developed by Bandura (1977), Teacher Self-Efficacy was determined. This instrument consists of 6 subscales. Only subscales that are linked to didactical strategies were retained in the current version of the instrument. We excluded items related to the following subscales: parental involvement, community involvement, and positive school climate. For each subscale, we report the number of items and the subscale reliability level):

Decision-Making Self-Efficacy (3 items, $\alpha = .70$):

- I express my views freely on important school matter
- I get the instructional material and equipment that I need

Instructional Self-Efficacy (8 items, $\alpha = .76$):

- I keep students on task on difficult assignments
- I motivate students who show low interest in schoolwork

Disciplinary Self-Efficacy (3 items, $\alpha = .72$):

- I control disruptive behaviour in classroom
- I prevent problem behaviour on the school ground

Self-efficacy statements were scored by respondents on a scale of 0 to 100, indicating the degree of confidence respondents have in relation to carrying out a certain task. A high level of internal consistency was found for the total instrument ($\alpha = .92$). Confirmatory factor analysis pointed at a good model fit: CFI = .938, aGFI = .912 and RMSEA = .068.

Didactical strategies

A third instrument was developed on the base of the observation instrument developed by Van de Grift (2007). The typology of the author was already introduced above. For each type of didactical strategies, students were presented with specific statements. They indicate – following a 5-point Likert scale - to what extent they agree with each particular statement. In this way, student teachers reported about their perceived adoption of the didactical strategies. Below, examples are given for each subscale, next to the number of items and the reliability at the subscale level:

Strategies that foster the adoption of learning strategies by learners (9 items, $\alpha = .78$):

- I encourage critical thinking of students.
- I encourage the use of control activities.

Strategies to match the teaching and learning activities to student characteristics (3 items, $\alpha = .72$):

- I provide extra instructional and learning time to weaker students.
- I encourage self-confidence in weaker students.

Strategies to make students actively engaged (4 items, $\alpha = .74$):

- I provide interactive instructional methods and strategies.
- I involve all students in class activities.

Strategies that centre on effective teaching (7 items, $\alpha = .73$):

- I give clear explanations about the subject matter.
- I clarify the learning objectives at the start of the lesson.

Strategies that help to organise the teaching activities (4 items, $\alpha = .78$):

- I focus on effective instructional time management.
- I promote an effective classroom management.

Strategies to develop the classroom climate (4 items, $\alpha = .76$):

- I boost up the self-confidence of the students.
- I provide a relaxed atmosphere.

The overall internal consistency of the scale is high ($\alpha = .90$). As to the validity of this newly designed instrument, confirmatory factor analysis was carried out, showing an acceptable model fit: CFI = .973, aGFI = .907 and RMSEA = .087.

Analysis approach

As explained above, confirmatory factor analysis was carried out by applying SEM Amos 7.0 (Arbuckle, 2006) to check the validity of the research instruments. To study the first research question, descriptive statistics, one-sample t-test, and Cohen's *d* effect size were calculated. A one-sample t-test was applied to check whether the adoption of the didactical strategies was up to a benchmark. As will be explained below, a standard of 80% was put forward as a critical bench. In view of the second research question, linear regression analysis was applied after checking the significant correlations between the research

variables. All related analyses were carried out with IBM SPSS version 19 (Nurosis, 1993).

Results

Descriptive results

To explain the descriptive results, *Mean*, *SD*, one sample *t-test*, and Cohen's' *d* effect size were calculated. Table 1 (Appendix) shows the descriptive results in details.

<Please insert table 1 around here>

At a general level, the results in Table 1 reflect less developed or less outspoken student teacher pedagogical beliefs; see especially instructional self-efficacy beliefs ($n = 250$, $M = 11.27$, $SD = 2.87$). Consistently, self-efficacy beliefs are also low. The same applies to the perceived adoption of the varying types of didactical strategies.

Adoption of the didactical strategies by student teachers

In view of the first research question, we study the results in Table 1. As stated earlier, this table shows varying levels of adoption of didactical strategies by student teachers. The question is whether this adoption is up to a standard? Since authors stress the importance of these didactical strategies, a high mastery level should be expected (see, e.g., Butler, 1990). The mastery learning literature stresses that learners should only continue the learning process if they attain learning goals at a high level and a minimum score of 80% should be put forward (Bentler & Bonett, 1980; Butler, 1990; Guskey, 1987; Slavin, 1987). In Table 1, we tested – on the base of a one-sample *t-test* – whether the average reported adoption level of the types of strategies is up to this benchmark. Looking at the one-sample *t-test* results, we can conclude that the adoption of all types of didactical strategies is consistently significantly below the benchmark. As to effect sizes, we observe medium ($d > .5$) to high effect sizes ($d < .8$).

The relationship of student teacher cognitions with the adoption of didactical strategies

Independent of the fact whether the reported adoption of types of didactical strategies is up to the benchmark, the second research question explores the relationship between teacher cognitions and the adoption of each particular didactical strategy. In view of this, six linear regression models have been carried out. Table 2 (Appendix) summarises the analysis results.

<Please insert table 2 around here>

The regression results presented in Table 2 indicate that three particular teacher cognitions are significantly associated with the adoption of 'didactical strategies that foster the adoption of learning strategies by learners'. Constructive Pedagogical Beliefs, Traditional Pedagogical Beliefs and Instructional Self-Efficacy beliefs explain 40.7% of the variance ($F_{(5,244)} = 35.19$; $\alpha R^2 = .40.7$, $p < .01$). According to the regression coefficients (β), we can conclude that when Constructivist Pedagogical Beliefs increase by one unit, we observe an increase of .363 in didactical strategy adoption. The latter is also observed when the Traditional Beliefs are increased with one unit (.409 units increase) and when Instructional Self-Efficacy Beliefs increase with one unit (.168 increase).

As to the adoption of didactical strategies to match to student characteristics, four student teacher cognitions play a significant role and explain 26.4% of the variance ($F_{(5,244)} = 18.84$; $\alpha R^2 = .26.4$, $p < .01$). Building on the regression coefficients (β), an increase with one unit in constructivist teaching beliefs is linked to an increase of .348 units in the adoption of this didactical strategy. An increase with one unit in traditional beliefs goes together with an increase with .353 units; an increase in instructional self-efficacy results in an increase of .325 units; and an increase in disciplinary self-efficacy results in a decrease with -.160 units.

When it comes to the adoption of strategies to make students actively engaged, three student teacher cognitions play a significant role and explain 31.2% of the variance ($F_{(5,244)} = 23.53$; $\alpha R^2 = .31.2$, $p < .01$). Building on the regression coefficients (β), we can conclude that an increase with one unit in the score for Constructivist Pedagogical Beliefs, we observe an increase of .201 units in the adoption of strategies to make student actively engaged. An increase with one unit in Traditional Pedagogical Beliefs goes together with an increase with .485 units in activating student engagement; an increase in Disciplinary Self-Efficacy results in increase with .130 units in strategies to make student actively engaged.

Three student teacher cognitions are significantly associated with perceived student teacher adoption of strategies to centre on effective teaching. Constructive Beliefs, Traditional beliefs and Instructional Self-Efficacy beliefs explain 40.5% of the variance ($F_{(5,244)} = 34.92$; $\alpha R^2 = .40.5$, $p < .01$). According to the regression coefficients (β), we can conclude that when Constructivist Beliefs increase by one unit, we observe an increase of .228. The latter is also observed when Traditional Beliefs increase with one unit (an increase of .496

units) and when instructional Self-Efficacy Beliefs increase with one unit (.162 increase).

Next, three student teacher cognitions are significantly associated with the extent to which student teachers strategies to organise teaching. Constructive Beliefs, Traditional Beliefs and Disciplinary Self-Efficacy beliefs explain 40.7% of the variance ($F_{(5,244)} = 35.22$; $\alpha R^2 = .40.7$, $p < .01$). According to the regression coefficients (β), when Constructivist Beliefs increase by one unit, there will be an increase of .247 in the strategies to organise teaching. The latter is also observed when the Traditional Beliefs are increased (an increase of .555 units) and when Disciplinary Self-Efficacy Beliefs increase with one unit (.210 increase).

Lastly, four student teacher cognitions are significantly associated with the extent to which student teachers adopt strategies to develop a positive classroom climate. Traditional beliefs, decision-making Self-Efficacy beliefs, instructional Self-Efficacy beliefs and Disciplinary Self-Efficacy beliefs explain 36.5% of the variance ($F_{(5,244)} = 29.67$; $\alpha R^2 = .36.5$, $p < .01$). According to the regression coefficients (β), when Traditional Pedagogical Beliefs increase by one unit, we observe an increase of .486 in the strategies to develop positive classroom climate. When the Decision Making Self-Efficacy beliefs are increased (an increase of .189 units); when instructional Self-Efficacy Beliefs increase (.206 increase) and when Disciplinary Self-Efficacy Beliefs increase with a unit (.151 increase).

In our models, we observe the highest proportion of explained variance in the adoption of the following didactical strategies: strategies to activate adoption of learning strategies ($\alpha R^2 = .40.7$); strategies that help to organise the teaching activities ($\alpha R^2 = .40.7$) and strategies that centre on good teacher instructions ($\alpha R^2 = .40.5$).

Discussion

The purpose of the present study was to investigate 1) the current adoption of didactical strategies in teacher education institutes and 2) how this adoption is associated with particular teacher cognitions (self-efficacy and pedagogical beliefs). This is the first ever study in Pakistan exploring didactical strategies in association with self-efficacy and pedagogical beliefs.

As regard to the first research question, we perceive overall low results in terms of student teachers' adoption of all types of didactical strategies. Consistently, their perceived adoption scores are significantly below the benchmark. The present study was based in the

most developed and largest province of Pakistan where half of the country's population is dwelling and the literacy rate is higher than the other provinces of the country (Barrs, 2005). The lower results in this province can predict the situation in other provinces. These results are in line with the findings of Sarwar, Aslam and Rasheed (2012) who also showed that student teachers in Pakistan reflect a weak adoption of a variety of didactical strategies in classrooms. But, our results contrast with the findings of Kukk and Vahter (2012) who studied student teacher preparation in terms of the adoption of teaching strategies to be employed in their actual classrooms. Student teachers reflected a low level of adoption of teaching strategies and were satisfied with the didactical strategies used by their teacher educators when preparing them for real classroom teaching. The latter points at the critical role teacher educators play in view of the adoption and implementation of didactical strategies.

Researchers – in the Pakistan context – repeat that teacher educators do not sufficiently prepare student teachers in adopting effective didactical strategies (Kanu, 2005). The latter cannot take place until a careful planning on the part of teacher educators is assured. This planning can involve, among other things, joint efforts by teacher educators and student teachers in successfully implementing particular instructional strategies during the teacher education process (Tanner, Chatman, & Allen, 2003). In Pakistan teacher education, there is a lack of such planning, resulting in a lack of embracing a large variety of didactical strategies by student teachers (Ali, 2011).

Hattie (2009) presents in this context meta-analytic evidence that the quality of teacher education has a significant impact on the quality of education. But at the same time he points in a very critical way to the nature of teacher education that does not reflect the complex reality of schools, does not model the teaching and learning approaches, and does not reflect an evidence-based approach to its own instructional design. He stresses the need to invest in professional development of in-service teachers and presents convincing results of a meta-analysis showing the direct beneficial relationship between professional development and learner performance in the classroom (Hattie, 2009, 109; effect size $d = 0.62$).

In Pakistan, some initiatives have been taken to address the related challenges, by focusing on teacher education. Teacher educators' cadre has been improved by

implementing basic reforms in the entire country. For instance, the Education Sector Reform (ESR) has been implemented in the country with the main objectives of improving teacher qualifications and also by implementing the National Education Assessment System (NEAS). Through this assessment system, the quality of teaching will be monitored and assessed in Pakistan teacher education institutions.

Moving to more specific types of didactical strategies in the current study, 'strategies that foster the adoption of learning strategies by learners', our results indicates a low-level adoption of these strategies by student teachers. In this context to look to what extent student teachers themselves adopt such learning strategies. Our results are – in this context - in contrast with the results of Pedro (2005), who focused on pre-service teachers perceived adoption of self-reflection strategies. Their findings indicate that student teachers perceived adoption was positive. But - and this is important in the context of the present study – the findings also reveal that they interpreted and practised these self-reflection strategies explicitly during the teacher preparation programme. As a consequence, they also explicitly learned to adopt self-reflection strategies for learners.

Our results are in line with the study of Cao and Nietfeld (2007) who studied the adoption of metacognitive awareness strategies by student teachers in a mid-size university in the south-east of the USA. Their study revealed a weak adoption of these strategies. Interestingly, these researchers also found that the weak adoption could be linked to student teacher difficulties; such as problems in understanding these key strategies. Lee (2005) found comparable results when focusing on the adoption of reflective thinking strategies by pre-service teachers in Korea. Other authors link this to the poor outcomes of the teacher education process (Glewwe, Hanushek, Humpage, & Ravina, 2013).

At international research level, current study findings are in line with the studies based in developing countries (Allamnahrah, 2013; Ijaiya, Alabi, & Fasasi, 2010) and in contrast with the studies done in developed countries (Castro, Kelly, & Shih, 2010; Patterson, Collins, & Abbott, 2004).

The student teachers results regarding their perceived adoption of 'strategies to match the teaching and learning activities to student characteristics' are clearly below the benchmark. The results of present study are inconsistent with the study of Kuyini and Mangope (2011) in Ghana who found a low-level adoption of teaching strategies mailing at

the inclusion of all students. Their study also examined pre-service teachers' beliefs about teaching students with diverse abilities/disabilities. These were not supportive to adopt particular strategies to meet the diverse demands. In a recent large-scale study – involving 4394 student teachers, 880 graduates, 294 principals and school mentors – Valcke, Struyven and Rots (2012) studied the perceived attainment of professional teacher competences by student teachers. Their results point out that competences were attained below the benchmark when it comes to dealing with: diversity, learners with a lower social, economic status, children with a different language background, learners in difficult city areas, and learners with learning difficulties. It is also striking that recently graduated teachers reflect even lower scores than student teachers. The authors refer in this context to the theory-practice shock (see also, Caires, Almeida, & Martins, 2009; Darling-Hammond & Baratz-Snowden, 2005). In their discussion of these results, the authors refer to (1) the nature of the teacher education lacking sufficient time to practice these strategies through, e.g., internships; (2) the lack of adoption of the related strategies by the teacher educators during the teacher education process; (3) the competences of the teacher educators themselves have insufficient experience with the related strategies. The authors suggest – next to changes in the teacher education didactical approach – to develop teacher educator competences and refer to international attempts to develop standards for teacher educators (see e.g., Geursen, Korthagen, Koster, Lunenberg, & Dengerink, 2012; Murray, 2005). Our results can be interpreted in the perspective of an overall decline in Pakistan teacher education in which individual differences, learning disabilities, and students' giftedness are ignored. In Pakistan inclusive classroom, no individualised educational approaches are adopted to cater for giftedness or disabilities (Pasha, 2012).

In the current study, also 'strategies to make students actively engaged in the classroom' were weakly adopted. Our findings are in a sharp contrast to the findings of Marks (2000), who found a strong adoption of classroom engagement strategies by secondary school teachers in the USA. On the other hand, research set up in developing countries points recurrently at a weak adoption of such teaching strategies; see, e.g., the studies set up in Ecuador by Valcke and Chiluita (2001). Their findings show teacher use low-level questions that only invoke memorising and that teachers do not adopt inquiry-invoking strategies. Our findings can be linked to the authoritative teaching still prevailing in Pakistan educational

institutions, where the teacher is the ultimate authority controlling the entire teaching and learning process without engaging students in the classroom instruction (Sarwar et al., 2012).

'Strategies that centre on effective teaching' is linked to optimal choices for 'didactical strategies' to attain the learning objectives. Our findings are in a contrast with the study of Santagata, Zannoni and Stigler (2007), who involved pre-service teachers evaluating their perceived adoption of strategies that make learning content transparent and understandable. In their findings, student teachers reported improved ability in the achievement of the learning objectives after the lesson. But, our results are in line with research in Africa (Hardman, Ackers, Abrishamian, & O'Sullivan, 2011) and in Pakistan (Kanu, 2005). Researchers in the African and Asian context explain the state of affairs by pointing to the non-availability of quality assurance systems that could identify these shortcomings (Materu, 2007). Dilshad (2010) studied on the quality assurance indicators in pre-service teacher education institutions in Pakistan. Their findings reflect the need for implementing urgently such a quality assurance system in the Pakistan context. In this context, the Accreditation Council of Teacher Education (ACTE) has put forward standards for teacher education (NACTE, 2009). It is promising that the HEC, the main quality assurance body in Higher Education will closely monitor the performance of the newly established Quality Enhancement Cells (QECs) in both public and private sector institutes in Pakistan (HEC, 2011).

'Strategies that help to organise teaching activities' indicate a low-level adoption. These results are in line with the study of (Kher, Lacina-Gifford, & Yandell, 2000) who found a weak adoption by pre-service teachers' of classroom management strategies. The findings further revealed that student teachers rely heavily on school principals, senior teachers, and parents in view of classroom management. In contrast, in the study in the study of Westbrook et al., (2009) set up in the Khyber Pakhtunkhwa province of Pakistan, both the perceived and actual adoption of classroom directions by novice teachers in secondary schools was satisfactory. But, these novice teachers linked this to the skills taught by their teacher educators. This decline is a matter of concern for teacher education programmes in Pakistan.

Our results in relation to the 'adoption of strategies that foster the classroom climate'

contrast the findings of Fajet, Bello, Leftwich, Mesler, and Shaver (2005) who observed a positive adoption of stress-free learner-teacher relationships by pre-service teachers. But their findings are linked to an explicit training intervention in the teacher education context. Also, it has to be stressed that – in the Pakistan context – researchers indicate that learners in classrooms are more obedient (Kanu, 2005). His findings also point out that in the South Asian context, submissiveness is a cultural value and prevails in the classroom climate.

Pedagogical beliefs have been at the centre of research about teacher education, but there is hardly research available that links these pedagogical beliefs with the adoption of didactical strategies. Our research model proved significant associations between pedagogical beliefs and the adoption of particular types of didactical strategies. Both constructivist and traditional beliefs are linked to particular of didactical strategies. These results are in line with the study of Wong, Chan and Lai (2009) in Hong Kong perspective, where 604 pre-service teachers' perceptions were studied in order to determine the relationship between pedagogical beliefs and didactical strategies. Their findings show that the adoption of didactical strategies was especially obvious when constructivist beliefs were considered. Also, Fives (2003) confirms the positive relationship. This is in line with the theoretical conception that pedagogical beliefs shape up didactical practices in the classroom (Kagan, 1992; Nespor, 1987; Pajares, 1992). But, no comparable studies could be found in the literature, set up in the Pakistan student teacher context. This can be linked to the still evolving teacher education practices and the fact that policies have but recently been implemented (HEC, 2011).

Also, Self-Efficacy beliefs seem to be linked to the adoption of particular didactical strategies. Especially Decision-Making Self-Efficacy, Instructional Self-Efficacy, and Disciplinary Self-Efficacy Beliefs reappear in a clear link with the adoption of didactical strategies. Previous research studies also found self-efficacy beliefs to be positively linked to particular didactical strategies (Albion, 1999; Linnenbrink & Pintrich, 2003; Schoon & Boone, 1998). Also, the study about novice teachers of Eslami and Fatahi (2008) proved that highly self-efficacious teachers are more confident in applying didactical strategies to motivate and engage students, to develop a friendly classroom climate and to organize their teaching activities.

Implications of the study

The findings of the present study present significant implications for Pakistan teacher education. The results call for more congruency in the way they teach their students and how they could mirror the variety of didactical strategies in the teacher education itself. The results also suggest a critical need for the continuous professional development of Pakistan teacher educators (White, Bloomfield, & Cornu, 2010). They should also be continuously challenged as to their knowledge base about didactical strategies and their teaching competences. Also, the results suggest a need for developing benchmarks as to the current quality of Pakistan teacher education. Curriculum developers and educational policy makers could put forward related standards to inspire such benchmarking exercises on a regular base. Considering the findings about the second research question, future initiatives should consider related student teacher cognitions. Research shows in a convincing way that student teacher beliefs and their self-efficacy can be uplifted by adequate pre-service teacher development initiatives.

Limitations and directions for future research

The present study reflects certain limitations. First, our research instruments were designed in a Western context. Adaptations to the Pakistan context and the Urdu language could be considered; implying additional reliability and validation studies are required. Next, we did not distinguish between first and second-year students. Distinguishing these subsamples could help identifying whether students evolve over time in their perceived adoption of didactical strategies. Adopting a mixed method approach could enrich the use of surveys. Interviews and observations could help to get a better picture of the actual adoption of the strategies and develop more in-depth explanations about their (non) adoption. Though a large number of student teachers were involved in the study, this number is still too small considering the size of the student teacher population in Pakistan. Iterations of comparable studies could involve samples from other provinces and institutions.

Conclusion

The current study focused on the perceived adoption of didactical strategies in Pakistan teacher education and how this adoption is related with student teacher cognitions. The results of our study add to our knowledge about the importance to be attached to student

teacher cognitions and didactical strategies adoption. They emphasise there is a large need for innovation in Pakistan teacher education. In general, overall lower scores clearly reflect the weak adoption of didactical strategies by student teachers in Pakistan teacher education programmes.

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Appendices

Table 1. Descriptive results of the student teachers' cognitions (Pedagogical and Self-Efficacy Beliefs) together with the adoption of didactical strategies (N=250)

Variable	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
Constructivist Beliefs	12.94	2.70		
Traditional Beliefs	13.19	2.60		
Instructional self-Efficacy Beliefs	11.27	2.87		
Disciplinary Self-Efficacy Beliefs	12.31	3.60		
Decision making Self-Efficacy Beliefs	11.34	3.65		
To activate the adoption of learning strategies	13.20	3.37	6.03**	0.76
Strategies to match to students characteristics	12.68	3.72	6.14**	0.77
Strategies to make students actively engaged	13.74	3.50	5.09**	0.64
Strategies center on effective teaching instructions	13.43	3.30	5.84**	0.74
Strategies help organize teaching activities	13.27	3.71	5.29**	0.67
Strategies to develop positive classroom climate	13.66	3.91	5.14**	0.65

Note: ** $p < .01$; * $p < .05$

Table 2. Overview of the regression results for the six models with pedagogical beliefs and self-efficacy as predictor variables

<i>Dependent variable to activate adoption of learning strategies, $F_{(5,244)} = 3.19$; $aR^2 = .40.7^{**}$ (N=250)</i>				
Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	-.202	1.04		-.194
Constructive Beliefs	.363	.083	.291	4.39**
Traditional Beliefs	.409	.087	.143	4.68**
Instructional SE	.168	.076	.164	2.19*
<i>Dependent variable to match to student characteristics $F_{(5,244)} = 18.84$; $aR^2 = .26.4^{**}$ (N=250)</i>				
Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	1.83	1.28		1.10
Constructive Beliefs	.348	.102	.275	4.01**
Traditional Beliefs	.353	.107	.247	3.28**
Instructional SE	.325	.094	.251	3.46**
Disciplinary SE	-.160	.068	-.155	-2.34*
<i>Dependent variable to make students actively engaged $F_{(5,244)} = 23.53$; $aR^2 = .31.2^{**}$ (N=250)</i>				
Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	1.54	1.16		1.32
Constructive Beliefs	.201	.093	.155	2.16*
Traditional Beliefs	.485	.098	.360	4.95**
Disciplinary SE	.130	.062	.133	2.08*
<i>Dependent variable to centre on good teaching $F_{(5,244)} = 34.92$; $aR^2 = .40.5^{**}$ (N=250)</i>				
Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	.301	1.02		.295
Constructive Beliefs	.228	.081	.187	2.81**
Traditional Beliefs	.496	.086	.391	5.79**
Instructional SE	.162	.075	.141	2.16*
<i>Dependent variable to organize teaching $F_{(5,244)} = 35.22$; $aR^2 = .40.7^{**}$ (N=250)</i>				
Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	-1.25	1.14		-1.09
Constructive Beliefs	.247	.091	.180	2.71**
Traditional Beliefs	.555	.096	.390	5.78**
Disciplinary SE	.210	.061	.205	3.45**

*Dependent variable: to develop positive classroom climate $F_{(5,244)} = 29.67$; $aR^2 = .36.5^{**}$ (N=250)*

Model	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>
1 (Constant)	-1.00	1.25		-.800
Traditional Beliefs	.486	.105	.323	4.63**
Decision Making SE	.189	.067	.176	2.81**
Instructional SE	.206	.092	.151	2.24*
Disciplinary SE	.151	.066	.140	2.27*

** $p < .01$; * $p < .05$

aR² refers to the adjusted R²

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Teacher educators and student teachers' adoption of didactical strategies in the initial teacher education (ITE) programmes in Pakistan

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Chapter 4

Teacher educators and student teachers' adoption of didactical strategies in the initial teacher education (ITE) programmes in Pakistan

Abstract

The present study explores the aspect of the adoption of didactical strategies by teacher educators and student teachers in Pakistan initial teacher education (ITE) programmes. Both teacher educators (N=32) and student teachers (N= 250) participated in the study. Survey instrument was administered to the respondents related to their adoption of varying didactical strategies. The results of the current study reveal an overall low-level adoption of varying types of didactical strategies in teacher educators and student teachers. In a comparative aspect, teacher educators' adoption of all types of didactical strategies remained higher than the student teachers. The study recommends certain measures for policy makers, curriculum developers, teacher educators, and heads of initial teacher education institutions in Pakistan. The findings of the study also call for the implementation of student-centred didactical approaches for successful and goal-oriented teaching and learning in the initial teacher education curricula in Pakistan.

Keywords: teacher educators, student teachers, initial teacher education, didactical strategies, and student-centred approaches

Introduction

Initial teacher education (ITE) has attained a special place in connection with the international discussion on teacher education. Researches reveals a theory-practice gap in the adoption of didactical strategies in initial teacher education practices (Korthagen, 2004; Valcke, 2013). This gap is linked with the quality of teacher educators and the programme structure offered to student teachers in institutes (Darling-Hammond, 2000). Avalos (2011) emphasises the quality of ITE programmes as the vital component when it comes to the

professional development (PD) of teacher educators.

In Pakistan ITE programmes (e.g., B.Ed. and M.Ed.), the major focus is given to subject-centred approaches where student teachers are supposed to be the passive listeners of teacher educators “lectures” (Khamis & Sammons, 2004). These ITE programmes are far away from the current worldwide practices, congruency, and coherence that are needed for the successful teaching-learning process (Hunzai, 2009; Rasheed, Aslam, Yousaf, & Noor, 2011). Successful ITE programmes are based upon the implementation of some basic educations models (Westbrook et al., 2009).

Pedagogical content knowledge (PCK) is often considered the fundamental model for the ITE programmes regarding the adoption of suitable didactical strategies (Shulman, 1987). Such models have never been given due place and implementation in ITE in Pakistan (Dilshad, 2010). Literature suggest that the actual theory-practice gap results in the teachers’ dominant teaching authority in the actual classrooms that hinder the implementation of students centred educational approaches (Avalos, 2011). To address these issues, educational “models” have been put forward for the implementation in ITE programmes to achieve the maximum teaching-learning goals (Ali, 2011; Darling-Hammond et al., 2005).

In the present study, we build on the importance of the adoption of didactical strategies. In the next section, we recapitulate the theoretical framework of the study. Next, we present our research design followed by the findings and conclusion of the study.

Theoretical framework

Initial teacher education

Teachers and teacher education are considered to be central in attempts to improve the overall quality of education (Akyeampong & Lewin, 2002; Lewin & Stuart, 2003; Little, 2006). But the quality of education is – in contrast to Western countries – at a low level in Pakistan (Khan, 2011). This low-level education quality has certain backgrounds: less motivated teachers, weak adoption of didactical strategies, notable theory-practice gap and non-availability of standardized evaluation system of teacher educators (Khan, 2011; Little, 2006) Moreover, there is no uniform teacher education system in Pakistan and the Initial teacher education (ITE) is offered at various levels in the country (Dilshad, 2010). Although

teacher educators recommend their student teachers adopting innovative methods of teaching, but the current teacher education practices are not congruent (Tahir & Taylor, 2013). Moving ahead to subject-centred curriculum, we found misinterpreted theoretical positions of teacher educators that lead them towards teacher-centred classroom practices. There is hardly focus on student-centred didactical approaches in the entire curriculum and the real implementation in the actual classroom setting (Mahmood, Ahmed, & Iqbal, 2013).

There is a deep-rooted culture of theory-oriented assessment of students in the entire examination system that leads towards the book-oriented g instead of student-centred teaching (Mahmood, 2014). In the curriculum of initial teacher education (see the handbooks of all subjects), there is an inclusion of innovative didactical approaches i.e. student-centred collaborative didactical approaches as a model to be adopted. But as a matter of fact, in actual ITE programmes, teacher educators themselves and student teachers are not practising these strategies. Traditional teaching methods are rather adopted and enforced in the ITE classes to make students crammers of various facts and knowledge to be reproduced in the examination (Ahmed, 2012). A non-cooperative behaviour of teacher educators and administrative hurdles are the great hindrances in the way of the implementation of collaborative didactical approaches in ITE programmes (Rarieya, 2005).

Teacher educators' professional identity

Teacher education, two main directions: technical direction versus professional orientation direction. Depending the direction, different teacher education strategies are being adopted, and different sets of competencies are being pursued (Beijaard, 1995; Korthagen, 2004). These two directions reveal different approach towards the identity of a teacher. In the current paper, we follow (see also Darling-Hammond, 1996; Day, 1999) the professional development direction. Professional development is based upon teacher educators' perception of professional identity (Beijaard, 1995). Very little research studies have been done on the concept of professional identity except for "life-cycle" research (e.g., Bloom, 1988; Huberman, 1993). In almost all cases, there is a lack of clear definition of teachers' professional identity (cf. Kompf et al. 1996). Identity can generally be defined as who, or what someone is, the various meanings people can attach to them, or the meanings attributed to others (Beijaard, 1995) From this point of view, we may conclude that the

concept of professional identity is based upon teachers' self-actualization, self-recognition and self-perception as a teacher (Korthagen, 2005).

Teachers' identity plays a vital role in the professional development of teachers throughout their career. It significantly determines the self-perception of teachers about themselves in particular and the teaching profession in general. Identity can be generated through social interaction and assuming the societal roles (Akkerman & Meijer, 2011). Self-actualization and self-evaluation are the processes of the formation of identity. Identity formation is the result of the individual's experiences, which one comes across in social interaction in day-to-day life (Lasky, 2005). Individuals are not always in favour of change, and sometimes they resist it while considering it a threat to their self-image and identity (Ruohotie-Lyhty, 2013).

Why do teacher educators and student teacher not adopt particular didactical strategies? In the former paragraphs, this question was related to the nature of teacher education, the exam oriented educational system and other contextual factors. In the literature, this is also linked to the "models" that are implicitly or explicitly adopted when educating or training (student) teachers. The professional identity of teachers and teacher trainers is critical in view of the adoption and implementation of educational innovations; such as innovative didactical strategies. In this context, Beijaard (1995) and Korthagen and Kessels (1999) introduce the concept of professional identity.

Building on the discussion of the theory-practice divides in teacher training, Beijaard, (1995) and Beijaard, Verloop and Vermunt (2000) states that education or training of teachers should not only consider the knowledge and skills of (student) teachers, but also their beliefs, mission and conceptions about teaching and learning that is important for the adoption of didactical strategies (Korthagen & Kessels, 1999).

Didactical strategies

Didactical strategies are defined as "clearly specified teaching methods that have been shown in controlled research to be effective in bringing about desired outcomes in learners" (Mitchell, 2014, pp. 3). These didactical strategies are having different identification such as teaching strategies, pedagogical strategies, etc. In the teaching learning process, a range of didactical strategies are adopted and implemented in the real classrooms to attain the

desired goals. These strategies may include lecture method techniques, group discussion, reciprocal peer tutoring strategies, excursion tours, and laboratory-oriented learning, etc. A number of such strategies are based upon, i.e., the transfer of the facts, information and knowledge to the learners; other are linked to those strategies that focus on solving students learning problems, i.e., student-centred learning, learning through doing, etc. This is vital that during learning phases (student)-teachers adopt a range of teaching strategies that are result-oriented (Loewenberg Ball & Forzani, 2009).

When we go through the relevant literature, we find that the teaching is built upon various important elements. Some researchers stress that teaching builds on the (1) mastery of subject matter knowledge and (2) the mastery of related Pedagogical Content Knowledge (PCK). The PCK approach stress on the adoption of the most relevant, concentrated, operative, operational, well-organized and resourceful strategies that aim at the processing of the content (Shulman, 1987). PCK enable the teacher educators to aligned the content knowledge with the adoption of the most appropriate didactical strategies (Shulman, 1999).

The literature suggests that in the recent decades the core philosophy of teaching has undergone a drastic change as there has been a shift from traditional teaching to constructivist teaching (Darling-Hammond, 1996). This shift of teaching (traditional to constructivist) is very crucial and relevant for the current study as we always focus on the adoption of the didactical strategies as the centre of the discussion. It is also linked with the recent discussion about the instructional strategies that are presented as the "role model strategies" in the initial teacher education programmes. The teacher education literature links the adoption of these (role model didactical) strategies with the professional development of teacher educators.

The literature indicates that there is hardly existence of the evidence-based strategies in the initial teacher education programmes. The criticism is vital on the theory-practice gap and the prevalence of non-evidence based didactical strategies (Hattie, 2009, p.109-110). The authors are of the opinion that the entire ITE programmes aim at the development of good future teachers and hence the lack of evidence-based strategies in the teacher education classes are not contributing to the teacher education overall (Hattie, 2009). An effective teacher training programme is always expected to be result-oriented that transfer

the authentic teaching approaches to the student teachers that are taught during these programmes (Pantić & Wubbels, 2010).

Korthagen (2005) holistic approach is widely acknowledged and adopted by teacher educators. It has six layers: environment, behaviour, competence, beliefs, identity, and mission. All these layers explain the real qualities of a teacher for the use of effective didactical strategies and professional development of teachers (Korthagen, 2005). This model explores the mission and identity of a teacher, which question him/her to be in the field of teaching and learning. This provokes the teachers to identify their factors, which motivated them to join the teaching profession. The behaviour of teachers is not an isolated factor rather is strongly interdependent on other factors such as competencies, environment, beliefs, mission and identity (Korthagen, Loughran, & Russell, 2006). All these factors play a vital role in the development of teachers' professional identity. In our next studies, we also linked student teachers behaviour with teaching beliefs.

The available theoretical and empirical base brings us to the current research question in the Pakistan context: what is the current state of the art situation as to the adoption of didactical strategies by student teachers and teacher educators? The results of this analysis are the input for a need analysis to develop an alternative teacher development intervention in the Pakistan context.

Research design

Research question

The present study investigates didactical strategies adopted by student teachers (ST) and teacher educators (TE) in teacher training institutions. A research question is formulated to guide this study:

- What is the current state of the art as to the adoption of didactical strategies by student teachers and teacher educators in ITE in Pakistan?

Participants

Punjab University Lahore and Bahauddin Zakariya University Multan were the participating institutes in the survey. The teacher educators and student teachers were selected with the help of the administration, and it was attempted to involve the teachers of all major subject

areas, i.e., languages, science and mathematics, social studies, humanities and arts. All student teachers were aged between 20-25 years including males and females enrolled in the final year of Masters in Education course. All teacher educators were aged between 25-55 years having Masters to Postdoctoral degrees in education and pedagogical sciences.

Instrument

The validated instrument of Van de Grift (2007) was used to measure student teachers' didactical strategies. Their cross-sectional study was conducted in seven European countries to observe didactical skills. In the survey instrument, each didactical strategy had various statements. All respondents indicated their responses on Likert scale from 1 (strongly disagree) to 5 (strongly agree). The teacher educators and the student teachers reported their perceived adoption of the didactical strategies. The overall reliability of the scale is calculated as ($\alpha = .90$). Following are presented examples of sub-scales, next to the number of items and the reliability at the subscale level:

Strategies that foster the adoption of learning strategies by learners (9 items, $\alpha = .88$):

- "I teach students how they can simplify complex problems".
- "I promote the application of what has been learned".

Strategies to match the teaching and learning activities to student characteristics (3 items, $\alpha = .70$):

- "I bridge the differences between learners and what they are expected to learn".
- "I encourage self-confidence in weaker students".

Strategies to make students actively engaged (4 items, $\alpha = .76$):

- "I use instructional strategies that activate students".
- "I promote that students do their best".

Strategies that centre on effective teaching (7 items, $\alpha = .83$):

- "I ensure that students have understood the learning content during the instruction".
- "I provide feedback to the students".

Strategies that help to organise the teaching activities (4 items, $\alpha = .81$):

- "I check – during activities - whether students performed the tasks in a proper way".

- "I ensure that the lesson is conducted in an orderly way".

Strategies to develop the classroom climate (4 items, $\alpha=.84$):

- "I promote mutual respect among students".

- "I show respect to the students through his/her behaviour and language".

Analysis approach

First of all, we carried out confirmatory factor analysis (CFA) by applying SEM Amos 7.0 (Arbuckle, 2006) to check the quality of the instrument. Next, all data were analysed with IBM SPSS version 19 (Nurosis, 1993).

We carried out descriptive statistics (*Mean* and *SD*) along with one sample t-test and also Cohen's *d* effect sizes to elaborate our results in details.

Results

The table 1 (Appendix) shows the results of model fit for the adoption of didactical strategies by teacher educators and student teachers.

< Please insert Table 1 around here >

Didactical strategies .000, $p < .005$. CFI and RMSEA values here reflect the good model fit of teacher educators and student teachers. CFI=. 973 and RMSEA=. 087.

The table 2 (Appendix) presents the descriptive results of teacher educators and student teachers adoption of didactical strategies and also the results regarding t-test and Cohen's *d* effect size.

< Please insert Table 2 around here >

The Table 2 reflects the results regarding our research question of the study. The Table presents the results regarding various types of didactical strategies adopted by teacher educators and student teachers. The descriptive results always reflect that student teachers scored lower than the teacher educators in all types of didactical strategies. For instance, the results regarding "Strategies to match the teaching and learning activities to student characteristics", student teachers ($n=250$, $M=12.68$, $SD=3.72$) and teacher educators ($n=32$, $M=15.66$, $SD=3.23$). The following Figure explains the comparative view of the adoption of didactical strategies between student teachers and teacher educators (Scale range 1-20).

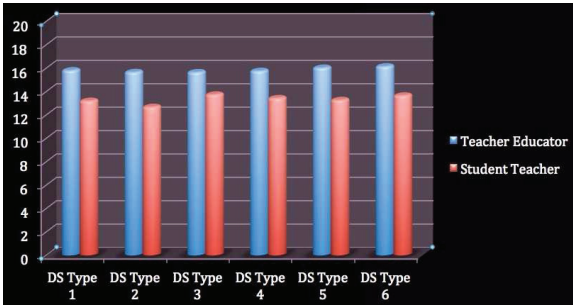


Figure3. Comparison of the adoption of didactical strategies in TE and ST

We raise a question here that how to match these results with a set standard or criterion? The relevant literature did not give us any hard and fast rules about the standard or criterion to be matched. However, the current teacher competency standard lists (see, e.g., Bartlett, 1992; Hager & Butler, 1996) implies a high-level mastery in the adoption of didactical strategies. The mastery learning literature urges that the learning process should be considered effective when there is a high-level achievement in the learning goals (Guskey, 1997). Authors put forward a minimum score of 80% as to be considered the high-level mastery on a given task (Bartlett, 1992). So keeping in view the literature, we put forward 80% as the minimum acceptable score for the adoption of didactical strategies. The results in Table 2 reflect the low-level adoption of didactical strategies by the both respondents (teacher educators and student teachers). When comparing the mean scores of teacher educators with student teachers, teacher educators always outperformed in the adoption of all types of didactical strategies. With the help of one sample t-test, we also calculated Cohen's d effect size to compare with the benchmark. All the results indicate that the level of adoption of all types of didactical strategies is always considerably underneath the benchmark. When elaborating Cohen's d effect size on student teachers' adoption, we always observe medium ($d > .6$) to high effect sizes ($d < .8$). In contrast, teacher educators results indicate larger effect sizes ($d > .9$) and ($d < 1.30$).

Discussion

The purpose of the study was to investigate the adoption of didactical strategies by teacher educators and perceived adoption by student teachers in the initial teacher education (ITE) programmes in Pakistan. The study was based upon a research question: what is the current

state of the art as to the adoption of didactical strategies in the teacher educators and student teachers?

The results indicate that teacher educators and students teachers adopted the didactical strategies usage that promotes the application of what has been learnt. The overall results of the study indicate that generally teacher educators and student teachers were aware of the significance of the usage of didactical strategies in the classroom. But as to the adoption level, student teachers adoption remained lower than the teacher educators in all types of didactical strategies. We can explain these results in the perspectives of Pakistan initial teacher education programmes where the focus is given on the teachers' traditional teaching methods without any practical involvement of student teachers in the activities (Ali, 2011). Pakistan ITE programmes are simply producing future teachers with limited creativity and less innovation that is a great hindrance in the way the future teachers are trained to become successful in the classrooms (Khamis & Sammons, 2004). So we can label Pakistan ITE programmes as "teacher-oriented" instead of student centred. This is because there have not been revisions in the curriculum of Initial Teachers Education for so many years. A recent study has confirmed that the situation is not different in the neighbouring countries, i.e., India, Bangladesh and Sri Lanka where course/syllabus is more dominant than the practical application of knowledge (Yadav, 2011). This syllabus domination prevents reflective practices and teaching strategies in Pakistan context that are vital for the professional development of teachers and the adoption of evidence-based didactical strategies (Ashraf & Rarieya, 2008).

A number of other elements are also attached with these traditional/teacher-centred didactical approaches. In Pakistan, overcrowded classrooms are not providing sufficient opportunities to teacher educators for the adoption implementation of student-oriented didactical strategies (Ahmed, 2012). There is also less prevalence of knowledge-refreshment culture in the ITE setup in Pakistan, and also there are fewer Professional Development (PD) opportunities for the teacher educators in Pakistan (Westbrook et al., 2009). Professional development for teacher educators always results in the higher level of the adoption of didactical strategies (Avalos, 2011). Once someone enters as a teacher educator, he/she will stay forever in the institute despite the poor performance. The fact is that there is no evaluation of teachers' performance where upgrading or downgrading can be awarded. In

this quality less teaching culture, teacher educators are not fearful of losing their jobs as majority of them works in government owned ITE institutions. A recent study conducted in Pakistan teacher education set up involving 10 heads of ITE institutes and 58 teacher educators, the findings of the study revealed that there are severe threats to quality assurance system in teacher education in Pakistan (Ahmed, 2012). They further concluded that although some serious steps have been taken by Higher Education Commission, and National Accreditation Council for Teacher Education (NACTE) to implement a standard quality assurance system by introducing Quality Enhancement Cells (QEC) in higher education institutes, but still there is a lot more to do for the assurance of quality teaching.

The results of the current study are in line with the findings of Ali (2000) and Rarieya (2005) who found less professionally developed teacher educators with low-level adoption of didactical strategies in Pakistani ITE classrooms. They also found rote learning and cramming as the popular means of learning instead of implementation of innovative didactical approaches by teacher educators. We assume and can explain that teacher educators' low-level adoption of varying types of didactical strategies is eventually reflected on student teachers perceived adoption.

There are notable gaps in Pakistani teachers subject knowledge and classroom's practical implications (Khattak, Abbasi, & Ahmad, 2011). The results also indicated that teacher educators are not using specific strategies to become aware of individual differences of student teachers and never provide extra instructional time and coaching to weaker students. It is likely that teacher educators in Pakistan are not trained in such a way to realise the importance of individual differences and hence they were teaching to all student teachers in the same authoritarian way. Our results are also in line with a study on pre-service teachers in Pakistan, where the results revealed no students' involvement in the classroom activities, and this indicates a one-way authoritarian teaching and learning process (Rizvi, 2015). We assume that this one-way teaching approach is the result of less trained teachers. Teachers are unable using collaborative teaching strategies that result in the form of isolated teaching in the classes. Perhaps, the teacher educators are not expert for the preparation of structured lessons to be delivered in the classes. Without clear lesson planning, it is difficult to assess whether the lesson objectives have been achieved (Azam, Fauzee, & Daud, 2014).

There are a number of issues with the ITE programmes in Pakistan such as policy planning, job structure, unqualified teacher educators, lack of in-service teachers training, etc. (Iqbal, 2011). All these factors are contributing towards the low quality of teacher education and less outspoken teachers' adoption of didactical approaches.

Limitations of the study

The present study has some limitations. First of all, the study was based upon the data collected through instruments made in Western context. The educational approaches in East and West are significantly different in many ways. We focused collecting quantitative data only on a survey instrument. A mixed method approach (interviewing, observation and survey) would be better for future researches to have an in-depth understanding of the issue. To maintain the reliability and validity, we did not translate the statements of instruments into Urdu (Pakistan national language). However, there were some statements, which were unfamiliar to the participants and confused them. It would also be a matter of interest for further researchers to explore the reasons and context of the low-level adoption of didactical strategies.

Implications for policy makers and teacher education institutions

The findings of the current study are very significant in Pakistan context where ITE is facing extreme challenges for its survival. First of all, curriculum developers and educational policy makers must understand that without effective initial teacher education programmes, it would not be possible to revolutionise the entire education system. Teachers are the key players for the transformation of knowledge and skills to convert an out-dated education system into an innovative one. If teacher educators were not trained in-line with the constructivist didactical approaches, it would be useless to expect advancement in the initial teacher education in Pakistan. ITE should be given top priority, and there must be frequent training sessions for all teacher educators where they can learn implementing collaborative teaching approaches. There must be some incentives to boost up teachers self-efficacy, teaching beliefs and self-esteem, which can be contributing factors for the high-level adoption of didactical strategies in ITE programmes.

Conclusion

The results of the study contribute to the confirmatory factor analysis of current adoption of

didactical strategies in ITE perspective in Pakistan. At this point, we were presented with a clear picture for the current state of the art situation of teacher education in Pakistan. The results of the current study have opened the new paths for further empirical research study to be explored. The results of the study urge the policy makers to set the new objectives for ITE in Pakistan with practical implication of innovative didactical strategies. The results clearly indicate that there is great need of innovative teacher training programmes to be implemented in ITE in Pakistan.

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Appendices

Table. 1 Fit results of structural equation model

Variable	CMIN	DF	P	CMIN/DF	GFI	AGFI	CFI	RMSEA
Didactical strategies	37.57	12	.000	3.13	.969	.907	.973	.087

Table. 2 Descriptive results of student teachers and teacher educators

Variables	Teacher educators (N=32)			Student teachers (N=250)		
	M (SD)	t	d	M (SD)	t	d
Strategies that foster the adoption of learning	15.81 (3.22)	3.19**	1.14	13.20 (3.37)	6.03**	0.76
Strategies to match the teaching and learning	15.66 (3.23)	2.91**	1.04	12.68 (3.72)	6.14**	0.77
Strategies to make students actively engaged	15.65 (3.59)	2.60**	0.93	13.74 (3.50)	5.09**	0.64
Strategies that center on effective teaching	15.76 (3.38)	2.95**	1.05	13.43 (3.30)	5.84**	0.74
Strategies that help to organize the teaching	16.03 (3.73)	3.07**	1.10	13.27 (3.71)	5.29**	0.67
Strategies to develop the classroom climate	16.15 (3.49)	3.49**	1.25	13.66 (3.91)	5.14**	0.65

5

Congruency between didactical strategies and intervention study: Exploring the impact of Reciprocal Peer Tutoring on student teachers' learning performance in initial teacher education

Based on:

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A., (2016). Impact of reciprocal peer tutoring on student teachers' learning performance in the initial teacher education. Manuscript under revision for *The Journal of Experimental Education*.

Chapter 5

Congruency between didactical strategies and intervention study: Exploring the impact of Reciprocal Peer Tutoring on student teachers' learning performance in initial teacher education

Abstract

To push teacher education practices, a study was set up to research the differential impact of reciprocal peer tutoring (RPT) as a key teacher education strategy on student teachers' learning performance, considering the potential impact of mediating variables i.e., intrinsic motivation, meta-cognitive awareness and self-efficacy beliefs. The quasi-experimental pre-test post-test study involved master level students enrolled in a teacher education program. During a complete semester, the students in the experimental condition participated in 24 reciprocal peer-tutoring sessions. Tutors were trained prior to the RPT implementation and used tutor-support materials during RPT sessions. Learning performance tests were administered together with scales focusing on intrinsic motivation, meta-cognitive awareness, and self-efficacy. Analysis of covariance results point at a positive significant differential effect of reciprocal peer tutoring on learning performance. However, no interaction effect was observed in mediating variables. Post-reciprocal peer tutoring open-ended responses were organized to analyse student teachers' reflections. Qualitative analysis reinforces the quantitative findings. Implications are presented for teacher education and educational policy makers with recommendations to adopt to a stronger extent collaborative ITE approaches; such as reciprocal peer tutoring.

Keywords: reciprocal peer tutoring, teacher education, teaching strategy, metacognitive awareness, intrinsic motivation, and student teachers

Introduction

Teacher education and the future adoption of didactical strategies

Research clearly suggests initial teacher education programmes are critical to sustain overall quality of education (Zeichner, 2010). Recent decades have witnessed perpetual discussions about the nature and aim of initial teacher education (ITE) (Johnson, 2006; Kramarski & Michalsky, 2009). Research focuses on the what, how and when to teach student teachers (Darling-Hammond, Chung, & Frelow, 2002; Darling-Hammond & Baratz-Snowden, 2005). A key discussion is related to the core competences to be developed in student teachers. Attaining these competences determines teacher's readiness for the job (Margolis & Doring, 2013; Page, 2015). These competence lists are continuously updated and challenged considering the changes in teacher responsibilities; e.g., stronger focus on health education, intercultural competences, global competences, etc. (Dervin & Hahl, 2015; Moynihan, Paakkari, Välimaa, Jourdan, & Mannix-McNamara, 2015; Yildiz & Palak, 2016). Developing teacher competences implies – next to the attainment of a critical knowledge base – especially the adoption of specific strategies. These strategies can be generic or specific; e.g., related to language teaching (Freeman, 1989), to citizenship (Ten Dam & Volman, 2004), to inclusive education (Nilholm & Alm, 2010). Successful future teacher preparation depends heavily on their adoption and implementation of didactical strategies in the classrooms (Darling-Hammond et al., 2002; Helsing, 2007). It is therefore not surprising that developing didactical strategies in future teachers' practices is presented as a key quality indicator of ITE programs (Hollins, 2011).

Research stresses that what student teachers experience regarding teaching strategies during their ITE programmes, will influence their future classroom practices (Guskey, 2002). It also develops their (mis) understanding of pedagogy and learning processes in students (Ryan, Carrington, Selva, & Healy, 2009). Previous studies reflect a low-level adoption of a large variety and especially of innovative didactical strategies by student teachers and teacher educators (Shahzad, Tondeur, Zulfqar, & Valcke, 2015). The latter questions the way these student teachers will approach their future teaching assignment (Zeichner, 2005). Available research therefore criticizes the efficacy and efficiency of ITE programmes

resulting in a rather weak adoption and implementation of a variety of didactical strategies in daily classroom practice (Southgate, Reynolds, & Howley, 2013). It is observed that teachers replicate the way they have been trained and that there is large gap between what is being “said” and what is being “done” in the teacher education classroom (Korthagen & Kessels, 1999; Korthagen, 2004). Most ITE approaches do not mirror the full range of didactical strategies to be adopted by future teachers (Lunenberg & Korthagen, 2003). To what extent does ITE adopt differentiation strategies, does it consistently apply active teaching strategies such as RPT? Does ITE experiment with a range of didactical strategies related to classroom management? Researchers conclude that student teachers do – in this way – not become equipped with the full range of teaching approaches to meet current classroom demands (Carter, 2015). This explains why many authors call for a change in the design and implementation of ITE programmes (see e.g., Grover, 2015; Hattie, 2009; Smith & Lev-Ari, 2005; Walkington, 2005). Author (see, e.g., (Valcke, 2013).

Building on the above, and especially the observation there is a lack in adoption of active and collaborative didactical strategies by student teachers, reciprocal peer tutoring (RPT) was put forward as a teacher education didactical strategy. In the literature, RPT is presented as an effective strategy in view of supporting students’ cognitive processes attaining higher learning outcomes (see e.g., Arco-Tirado, Fernández-Martín, & Fernández-Balboa, 2011; De Backer, Van Keer, & Valcke, 2012a). RPT is considered an influential didactical strategy involving students in active learning processes (Topping, 1995). RPT builds on peer interaction and peer assessment strategies (Al-Barakat & Al-Hassan, 2009). Though we observe a growth in the adoption of collaborative teaching strategies in teacher education (see e.g., Graziano & Navarrete, 2012; McDonald, Kazemi, & Kavanagh, 2013), there is hardly research available about peer tutoring as a component of basic teacher education. Nevertheless, researchers point at its potential. For instance, Niemi (2002, p. 765) states that “ (student) teachers who wanted to tutor their pupils to become active learners had a new pedagogical role. They became facilitators, who gave more responsibility to students.”

Therefore, this authors pushes the idea of adopting more “collaborative arrangements, more open tasks and projects”.

Next to the impact on learning performance, RPT is often linked to mediating variables,

such as metacognitive awareness, intrinsic motivation and self-efficacy (De Backer, Van Keer, & Valcke, 2015).

Schraw and Dennison (1994) stress students' cognitive processing is dependent upon their metacognitive awareness. Metacognitive awareness enables students to explore and organize deep level knowledge and to develop analytical and synthesis abilities that often bring about high-level learning performance (Young & Fry, 2008). In higher education, this is often linked to attempts to foster the adoption of metacognitive regulation skills (planning, monitoring and evaluation) essential for comprehension and mastery learning (Rahimi & Katal, 2012). Research has shown that RPT helps developing metacognitive awareness by increasing "shared" monitoring, orientation and evaluation activities (De Backer et al., 2015).

Intrinsic motivation is considered important to muster learners' willingness to pursue successful learning (Ryan & Deci, 2000). In collaborative learning settings in general and reciprocal peer tutoring in particular, intrinsic motivation helps to foster socially shared cognitions and peer learning (Cameron, Pierce, Banko, & Gear, 2005).

Next, self-efficacy has been found to be associated with task outcomes, student performance, job satisfaction, and other student beliefs (Tschannen-Moran, Hoy, & Hoy, 1998). Studies present evidence that student with higher self-efficacy levels outperform than students with lower levels of self-efficacy (Ferla, Valcke, & Cai, 2009). In the context of the present study, researchers found how RPT is linked to increasing self-efficacy levels (Celis, 2013; De Backer, Van Keer, & Valcke, 2012b; M. Griffin & Griffin, 1998).

The theoretical and empirical evidence brings us to the central research problem of this study that focuses on the exploration of the differential impact of RPT on learning outcomes and looks at the impact on related mediating variables. The added value of the current study is that it was set up in an initial teacher education setting in a developing country i.e., Pakistan. The study is set up in the context of Initial Teacher Education (ITE). RPT has been adapted to 'model' didactical strategies to influence future student teachers' performance, mediating variables and practices. Below, we present the related theoretical base that directed a quasi-experimental pre-test - post-test study.

Theoretical and conceptual framework

Initial teacher education

In the recent decades, we observed a critical debate about the nature of teacher education. Educationists, researchers, practitioners, policy-makers and other stake-holders question the future direction of teacher education in view of meeting the demands of the 21st century (Day, 2013). This is reflected in state-of-the-art teacher competency frameworks. But, at the same time this questions the quality of ITE and especially the way ITE defines and implements a curriculum that fosters the attainment of the competency frameworks. Initial Teacher Education curricula should be aligned with these objectives (Lunenberg, Korthagen, & Swennen, 2007). But, research suggests ITE does not consistently reflect congruency (Hamilton & Pinnegar, 2013). Polikoff (2013) stresses in this context that she observes a lack of aligned instruction in teacher education.

For instance, most teacher education programmes stress - at theoretical level - student-centred, and collaborative approaches, but in practice this is not reflected in ITE-practices. The concept of “teach as you preach” is often absent from the ITE classroom (Murray & Male, 2005; Struyven & De Meyst, 2010). Authors stress ITE would have a better impact when teacher educators themselves would practice themselves what they try teaching their student teachers (Darling-Hammond, 2000; Korthagen, Loughran, & Russell, 2006). Research – set up in the Pakistan context - shows a weak adoption of a rich variety in didactical approaches in ITE (Shahzad et al., 2015). This low adoption level is linked to the theory-practice gap and a lack of congruency between student teachers’ preparation and their future classroom practices (Valcke, 2013). In the context of the present study, we focus on RPT as a congruent didactical strategy to be adopted in an ITE context.

Didactical strategies

Didactical strategies are often labelled as ‘teaching strategies’, ‘instructional strategies’ or ‘pedagogical strategies’. They are a key part of teacher competences, next to the critical related knowledge base (Coles, Owens, Serrano, Slavec, & Evans, 2015). Didactical strategies refer to teacher decisions about the nature of the teaching and learning setting with the aim of achieving learning objectives in the students (Darling-Hammond, 1996; Day, 1999; Trees,

2013; Tudor, 2006). As a consequence, very different didactical strategies can be distinguished. Chickering and Gamson (1999) base their differentiation in strategies on seven principles. These principles refer gain to the critical need to guarantee that these strategies help attaining the learning objectives: (1) Encourage contact between student and faculty; (2) Develop reciprocity and cooperation among students; (3) Encourage active learning; (4) Give prompt feedback; (5) Emphasize time on task; (6) Communicate high expectations; (7) Respect diverse talents and ways of learning. Other authors add to this that the implementation of student-centred didactical approaches is also linked to a teachers' passion for teaching, his/her ability in managing diverse learners and recognizing the potential of collaborative learning (Shahzad et al., 2015; Struyven, Dochy, & Janssens, 2010; Suleman, Aslam, Habib, Gillani, & Hussain, 2011).

Didactical strategies can be classified into two main subsets: traditional and constructive strategies. Traditional strategies are often labelled as teacher-centred approaches that consider the teacher as the ultimate authority in the learning process. On the other hand, constructivist strategies put the student at the centre. They start from student actions, experiences, and build strongly on collaborative learning. Therefore they are often labelled as student-centred strategies (Day, 1999). In the present study we build on the latter and especially focus on didactical strategies that stress collaborative learning. Student-centred didactical strategies gives students a high responsibility and leading role in the teaching-learning process (Laal & Ghodsi, 2012; Ruys, Van Keer, & Aelterman, 2010). Reciprocal peer tutoring (RPT) fits into this cluster of collaborative learning based strategies (Barkley, Cross, & Major, 2014). In the next paragraph, we explain the nature and significance of reciprocal peer tutoring (RPT) as a key collaborative learning didactical strategy.

Reciprocal peer tutoring

Peer tutoring is a collaborative/cooperative learning strategy that puts students in a small group setting to help and support each other in view of attainment of knowledge and skills (Fantuzzo, Dimeff, & Fox, 1989; Topping, 1996). A number of peer tutoring strategies have been discussed in the literature. For instance, cooperative learning (Slavin, 1990), class-wide peer tutoring (Greenwood et al., 1984), reciprocal peer tutoring (Fantuzzo & Rohrbeck, 1992) and cross-age tutoring (Fogarty & Wang, 1982). Peer tutoring requires learners to establish a social relationship with fellow learners and often invokes the adoption of

metacognitive regulation skills during the learning process (Topping, 1995). Fantuzzo and colleagues (ibid, 1992) present a structured approach to peer tutoring. They label it as reciprocal peer tutoring (RPT) because they assign particular roles to participants in the tutoring context: tutor and tutee (Berghmans, Neckebroek, Dochy, & Struyven, 2013). In the peer tutoring setting, tutors monitor the activities of the tutees. Both roles are being switched during subsequent sessions; tutees take up the role of the tutor. This rotation guarantees all group members benefit from role-related advantages. Research points at the positive impact of both tutees and tutor roles due to their preparation of the reciprocal peer tutoring sessions (Topping & Bryce, 2004).

In the present study, we put forward RPT as an evidence-based strategy to be implemented in the initial teacher education as an alternative to the current predominance of lecture-driven strategies (Valcke, 2013). Researches indicate that the RPT strategy positively contribute in making students more vigilant, autonomous, and free for arranging their learning activities with peers and above all, RPT makes students master of their own learning (De Backer et al., 2012a). Authors also stress the importance of “tutor training” to guarantee proper implementation of RPT strategies (Dioso-Henson, 2012; Topping, 1996; Valcke, 2013).

As explained above, RPT is often linked to the impact on a variety of student variables; such as metacognition, intrinsic motivation, and self-efficacy. These are discussed in the next paragraphs.

Metacognitive awareness and regulation

Metacognition is generally defined as a perception of one's knowledge and application of that knowledge in view of successful learning (Efklides, 2009). Researchers distinguish between metacognitive knowledge and metacognition regulation (Schraw & Moshman, 1995). In the literature, especially metacognitive regulation is linked to RPT and learning performance (Pintrich & De Groot, 1990). Metacognitive regulation refers to ‘a set of self-regulatory skills and strategies which are used by students to actively control, coordinate, and regulate their learning’ (De Backer et al., 2015). These authors also stress this regulation can be about one’s own learning process, but also about the learning process of others in the learning context. This introduces the potential of focusing on metacognitive regulation

in an RPT context. Most authors distinguish between sub-categories in metacognitive regulation; such as planning, monitoring, and evaluation (Borkowski, Pressley, & Carr, 1987; Brown, 1987). Planning refers to strategies answering basic queries i.e., how to mainstream cognitive process? What is the focus of particular learning strategies? How to attain my learning objectives? Monitoring refers to the awareness of progress towards the specific learning objectives. Evaluation is linked to the judgment about the status of actual performance. It requires individuals to match the end results with the learning objectives (Schraw, 1998). As stated above, tutors in an RPT setting will foster the metacognitive regulation on the base of specific cues, instructions, guidelines, etc. Below will be explained how tutor cards help tutors and tutees to focus on the different regulation activities.

Intrinsic motivation

Intrinsic motivation (IM) pushes an individual to perform a task for the sake of self-satisfaction and pleasure (Deci, Koestner, & Ryan, 1999). IM differs strongly from types of controlled motivation; such as extrinsic motivation that depends on rewards such as grades or depends on external motivators linked to guilt or threats. Numerous studies underpin the positive impact of intrinsic motivation on learning performance (Dev, 1997). In addition, intrinsic motivation has found to be associated with student satisfaction, high self-esteem, high self-efficacy and good progress in academic tasks (Vallerand, 2012).

In the present study, we hypothesize RPT will foster intrinsic motivation and subsequently influences learning performance. Liu and Devitt (2014) explain this link by reiterating what learners strive after: autonomy, belonging, and competence. These three drivers of intrinsic motivation (see Ryan & Deci, 2000) indicate learners will be more motivated when they get responsibilities, when they are trusted to carry out tasks (autonomy), when they can work together with peers (belonging) and when they are supported to carry out tasks in a successful way (competence). Peer tutoring has already been found to enhance intrinsic motivation, next to its impact on learning performance (see e.g., (De Naeghel & Van Keer, 2013; Galbraith & Winterbottom, 2011). In the literature, hardly studies can be found that focus on RPT in an initial teacher education setting.

Self-Efficacy

Self-efficacy is defined as one's confidence to successfully carry out tasks (A Bandura, 1977).

Self-efficacy has proven to be linked to student achievement in academic settings (Brouwers & Tomic, 2000; Komarraju & Nadler, 2013; Topping, 1996). The link between self-efficacy and learning performance has empirically been established in collaborative learning studies (McQuiggan, Mott, & Lester, 2008). Other researchers present empirical evidence about the higher SE levels and better metacognitive relation in RPT settings (see e.g., Celis, 2013; De Backer et al., 2012a; Griffin & Griffin, 1998; Tsuei, 2012).

Pulling together the conceptual and theoretical base, we put forward the following hypothetical relationship between RPT, learning performance and the three related student teacher cognitions in Figure 2:

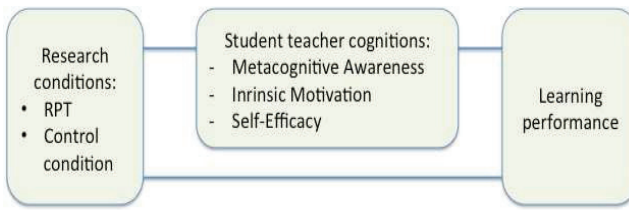


Figure 2. Hypothetical relationship between the research variables

Research design

Hypotheses

The current study looks at the differential impact of RPT on learning performance, as compared to a traditional lecture-based didactical strategy. Building on the framework, presented in figure 1, we put forward the following hypotheses:

1. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition.
2. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition, considering the mediating

impact of attaining a higher level in intrinsic motivation, an increase in metacognitive awareness and an increase in self-efficacy beliefs.

Participants

Participants were final year pre-service student teachers enrolled in a 2 year M.A Education programme at Bahauddin Zakariya University Multan Pakistan (session 2014-15). All participants were registered for the course "Teaching of English". Students were either enrolled in morning or evening classes. All students enrolled in the morning sessions were assigned to the experimental condition ($N= 21$); students enrolled in the evening sessions were assigned to a control condition ($N =27$). As explained in the results section, no significant differences were observed between students in both conditions in the research variables. All the students were between 20-25 years of age at the time of the study ($M=22.5$). Out of 48 students, 36 (75%) were females. All participants received a letter about the nature of the study in view of obtaining their informed consent. At the end of the study, students from the RPT condition ($N=5$) participated in open-ended written answers. In the RPT condition, the 21 students were divided into 7 groups of 3 students. Students representing 5 groups agreed to take part in the open-ended written answers. Power analysis was carried out in view of the current study (Cohen, 1992). To be able to determine a large effect size ($d >.80$), a minimum of 20 participants is required per research group. Current sample sizes are larger than this criterion.

Procedure

Prior to (t_0), in the middle (t_1) and at the end of the research period (t_2), all participants filled out a number of research instruments. From the start to the end of the semester, students in the experimental condition were involved in two peer tutoring sessions a week. Face-to-face reciprocal peer tutoring were set up that lasted one hour. In total, participants were involved in 24 hours of RPT during the 12-week intervention, set up in the regular classroom setting. The RPT involved same-age peers and was reciprocal in nature since all participants were class peers, switching the role of tutor and tutee (Topping, 1996). Prior to the sessions, tutors received a tutor training. Tutor training sessions were set up every 3 weeks, before the onset of a regular RPT session and involved only those students who would take up the tutor role in the subsequent weeks.

Design of the RPT intervention

The RPT was set up in the context of the course “Teaching of English”. In view of each RPT session, tutor training was set up and based on a tutor-training manual (see Appendix A). Tutors were trained regarding group management strategies, peer involvement strategies, brainstorming strategies and metacognitive regulation strategies and this clustered as “pre-tutoring” and “during tutoring” strategies.

Pre-tutoring strategies:

- provide the group members a solution plan to work out;
- ask specific questions that suggest a systematic approach;
- let the group work freely in the solution strategy.

During-tutoring strategies:

- ensure everyone in the group is actively participating in the activity;
- ensure the development of the learning task corresponds to the desired objectives;
- ensure the content is matching to the tutees’ knowledge;
- give feedback and ask content-related questions;
- monitor the progress of tutees within the group;
- delegate power to a tutee monitoring the session time.

The researcher acted as a trainer for the tutor training. Next to the formal tutor training, tutors were – prior to each session – informally reminded about the PT strategies.

To guarantee successful tutoring sessions, lesson specific tutor cards were developed and provided to the tutors. These cards presented key ideas to foster involvement of tutees in the collaborative learning activity. The researcher developed these cards in collaboration with the subject teacher. The tutor cards were developed in view of each specific RPT session and considered the specific lesson content being focused upon.

Research Instruments

At pre, mid and post-test periods, all participants were presented with a learning

performance test in relation to the course “Teaching of English”. The test was prepared with the help of the subject teacher. Items with varying difficulty levels were developed covering the different themes in the course and covering the following Bloom Taxonomy levels: comprehension analysis and synthesis domains. The learning performance test consisted of three types of questions: (1) multiple-choice questions; (2) short answer questions and (3) essay type questions (See Appendix).

In view of studying changes in metacognitive awareness, the instrument of Schraw and Dennison (1994) was adopted and administered. It was most suitable and reliable and in fact it was developed by the key authors (ibid, 1994) in the field. It consists of 26 statements, organized along four subscales. Respondents indicate – on a Likert scale - to what extent they agreed with each statement. For each subscale, we report in Table 1, the number of items, an example item, and the reliability level as calculated in the context of the present study.

To determine changes in Intrinsic Motivation, we adopted the Intrinsic Motivation Inventory of Ryan and Deci (2000). More information about subscales, examples, and reliability are reported in table 1 (Please see Appendix).

<Please insert table 1 around here>

To determine self-efficacy levels, the scale of Schwarzer and Jerusalem (1995) was adopted as it meets the needs of the current study and was based on the guidelines of social cognitive theory of Bandura (1986).

In view of the individual post-test open-ended written answers, students were invited to respond to the following questions:

- *How do you appreciate RPT as a didactical strategy?*
- *What were the developments in your thinking during RPT strategy?*
- *In your view, what are the main advantages of RPT strategy?*
- *In your opinion, what are the main hindrances you came across during the RPT strategy?*
- *How can RPT be developed into a better didactical strategy?*

In the next paragraphs, we explain the analysis approach for the quantitative and

qualitative data.

Analysis approach

To analysis the quantitative data, descriptive analysis and repeated measures ANOVA were carried out. In view of the analysis, related assumptions were tested (normality and homogeneity of variance). All analyses were executed with the statistical package SPSS, version 19 (Nurosis, 1993). A p-value of $p < .05$ was put forward. Given the small samples size in the present study, we look at - next to p-values - effect sizes to interpret the results (Cohen's d). When discussing the hypothesis testing results, Cohen's d will be interpreted taking critical benchmarks in mind as suggested by Baguley (2009): $d > 0.3$ = small effect size; $d > .05$ = medium effect size; $d > 0.8$ =large effect size.

Student teachers' responses were analysed via the content analysis. More specifically, a thematic analysis (Creswell, 2013) was carried out and themes were identified. Recurring information was categorized in relation to each particular question. Intra-ratter reliability was calculated after re-analysing – two weeks later - the student answers. Two experts ratters were assigned the task and they had to re-read the responses. Cohen's Kappa analysis was carried out as the result (.73) indicates substantial agreement reliability.

Results

Descriptive results

In table 2, we summarize the descriptive results (Mean & SD) for the dependant variable (learning performance) and co-variables (metacognitive awareness (MC), intrinsic motivation (IM) and self-efficacy (SE) at pre-test, mid-test and post-test (Please see Table 2 in Appendix).

<Please insert table 2 around here>

The initial learning performance in the experimental and control group hardly differs at t0. The results in Table 2 suggest clear changes in learning performance in both the experimental and the control group at t1 and t2. Figure 1 depicts changes student teachers' learning performance scores (out of 50) in the subject "Teaching of English" at the time of the pre-test, mid-test and post-test. These changes are hardly observed in relation to the different student teacher cognitions.

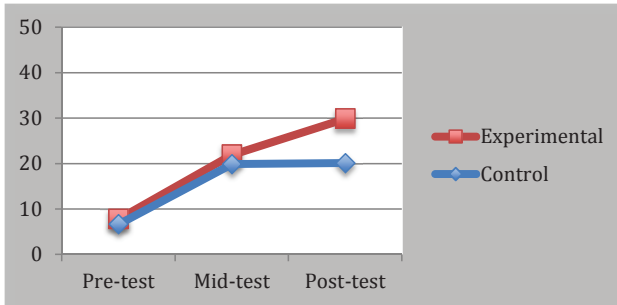


Figure 1. Changes in student teachers' learning performance at pre, mid and post test

The differential impact of RPT on learning performance

A repeated measures analysis of variance (ANOVA) was conducted to test the one directional hypothesis that there is a significant positive gain in student teachers' learning performance in the RPT condition group when measured before, during and after the intervention study ($N=48$). A clear significant increase in learning performance is observed over time - within subjects analysis - independent of research conditions ($F_{(2,46)}=159.19$, $p<.001$, $d= 3.75$). Cohen's d reflects a large effect size. As could be expected from Figure 1, an overall significant difference can be observed in changes over time in learning performance between the RPT and the control condition (between subjects, time * condition) ($F_{(1, 46)}= 25.33$ $p<.001$, $d = 1.49$). Cohen's d reflects a large effect size. As a consequence, we can accept hypothesis 1.

Test of within-subjects contrasts (time * condition) reveal no significant differences at t_0 ($F_{(1,46)}=2.57$, $p=.11$, $d= 0.4$), and no significant differences at t_1 ($F_{(1,46)}=0.35$, $p=.56$, $d= 0.1$). But the within-subject contrast analysis of learning performance reiterate the significant differences observed above at t_2 ($F_{(1,46)}= 9.16$, $p<.01$), $d= 0.9$). Cohen's d reflects a larger effect size.

The impact of mediating variables

Adding changes in the mediating variables (from t_0 to t_1 and from t_1 to t_3) as covariables in the repeated measures design, reiterates the significant changes over time and the differential effect of the RPT setting. But, no significant interaction effects are observed due

to changes in intrinsic motivation, metacognitive awareness, and self-efficacy. Already in the descriptive table, we could hardly observe changes over time in these variables (see Table 1). Therefore we have to reject the second hypothesis.

Analysis of the qualitative data

After finalizing the RPT intervention, five students from five different RPT groups were invited to take part and give their written response to the open-ended questions. Above we already listed the five key questions presented to each of the students. Analysis of student answers resulted in the identification of some critical themes.

How do you appreciate RPT as a didactical strategy?

In response to the question about the appreciation of the RPT didactical strategy, five out of five student teachers responded they experienced it as extremely helpful and beneficial strategy that could improve their learning in a number of learning domains. They said that at start, they were not accustomed to this new approach and felt confused regarding peer-interaction, tutor question in the session. They also consider the prevalence of shyness in the groups as a hindrance in the first sessions of the intervention study. But gradually and after the mid test, they felt acquainted with the approach. They got used to peer interactions and also felt a positive rapport with the tutors during the RPT sessions. They considered RPT as a confidence boosting strategy that removed shyness from weaker students in the group setting. They were of the opinion that RPT is a didactical strategy that works in a natural way, where students interact with each other to share ideas, develop social and educational skills and establishing a congenial rapport with one another: *At the start, I was bit confused and shy, but gradually the RPT strategy proved to a most successful didactical strategy and it enhanced my learning capabilities (Ayesha).*

What were the developments in your thinking during RPT strategy?

When discussing this question, four out of five student teacher responded that RPT hardly mentioned elements linked to student cognitions. When asked explicitly, student teacher responded that their metacognition; intrinsic motivation and self-efficacy beliefs were already fairly developed during their study. One student replied that to some extent, he boosted his self-efficacy through this intervention study and felt more efficacious and more motivated having participated in the intervention. But most students considered there was

no change: *So far as the increase in my cognitions is concerned, I don't think that RPT had an effect on them since I was already highly motivated and self- efficacious before participating in RPT. The previous long study years helped me in developing my self- confidence (Saira).*

In your view, what are the main advantages of RPT strategy?

While discussing, all respondents indicated they found RPT a wonderful collaborative didactical strategy. It created a positive and healthy group-learning environment and fostered their learning process. Student teachers were of the opinion that during the RPT activity, they felt freer to express their views as compared to traditional classroom settings where they have to sit silently in a controlling environment. In contrast, RPT developed their confidence level that was lacking in the regular classes. They maintained that the free nature of the learning environment during the peer interaction was a significant factor in their learning process: *I was relaxed and confident while asking questions from the tutor that I could not imagine asking from my class teacher in the regular classroom settings. RPT strategy proved to be a confidence booster (Sanam).*

In your opinion, what are the main hindrances you came across during the RPT intervention?

Student teachers' responses revealed that in some groups there were rifts between peers regarding the authoritarian style of the tutors. Four out of five respondents replied that the tutors were dealing their peers in an authoritative way and were not always cooperative. It seems some tutors were not supportive and they intended running the session in their own ways. A respondent explained that it was due to the lack of tutor's course preparation. And when tutees ask question to their tutor, instead of replying, he/she always give extra and sometimes irrelevant work in the context of an RPT the sessions: *Some tutors were misusing their roles as a tutor in the peer group activity. They were running the RPT sessions in an authoritative way (Rabbia).*

How can RPT be developed into a better didactical strategy?

In the respondents' opinion, several measures could make the RPT strategy even more effective and successful for student teachers during the actual classroom learning process. For instance, one student suggested the use of audio visual aids during RPT sessions. The

other four students suggested following measures to be taken: (i) positive reinforcement for weaker students (ii); extensive RPT training sessions to be set up for their regular teacher educators; (iii) mixing weaker and high IQ students in the peer groups. They also recommended that there must be stronger RPT awareness among students and teachers at the start of the course: *I would like to say that our class teachers should implement RPT activity in the regular classroom. For this purpose, our class teachers must be given training how to run RPT sessions* (Hina).

Discussion

In the current research study, we aimed at exploring the differential impact of RPT on student teachers' learning performance. We also focused on exploring the mediating impact of co-variables. The findings of the present study enrich the existing literature and provide evidence-based results for the implementation of RPT as a successful didactical strategy in initial teacher education.

Our research results support the positive differential impact of reciprocal peer tutoring (RPT) on learning performance in an initial teacher education (ITE) setup. These findings are in line with available research involving college students involved in RPT (Bell & Mladenovic, 2014; De Backer et al., 2012a; Griffin & Griffin, 1997). The results also reinforce findings of research implementing other collaborative and peer learning strategies in higher education in general (Miranda Suzanna Angeli De Hei, Strijbos, Sjoer, & Admiraal, 2015; Zheng, Niiya, & Warschauer, 2015) and teacher education more specifically (see e.g., O'Donnell & King, 2014). It also reiterates the voices of authorities in the teacher education arena (Darling-Hammond, 2012; Zeichner, 2005). To explain the positive impact we can refer to Vygotsky who stresses the supportive impact of sharing and the mediating role of peers in attaining the zone or proximate development (O'Donnell & King, 2014). Other authors link the positive impact to student teachers' beliefs about collaborative learning (Goddard, Goddard, Kim, & Miller, 2015; Richardson, 1998).

In figure 1 we can see how initially no differences in learning performance can be observed between both research groups at t1. The qualitative data help explaining this by stressing that for these students this was their first collaborative learning experience during their ITE. They felt initially shy and less confident but gradually they developed positive

peer-learning relations and became more confident. Also Kumari (2014) puts forward this observation, next to an emphasis on more extensive prior training to be involved in collaborative learning sessions. Also the latter was observed as a critical theme during the student teachers' responses.

In response to our second research question, we could not confirm the mediating role of student teacher cognitions during RPT on learning performance. The qualitative results, resulting from the respondent's answers confirm this. Students reported that prior to participation in RPT; students felt their cognitions were already well developed. Literature – related to self-efficacy – states the latter is enhanced largely by past performances (Schwarzer & Jerusalem, 1995); especially considering second-year students were involved in the present study. The study of Griffin and Griffin (1998) and Rittschof and Griffin (2001) present similar results where no relationship was observed between RPT implementation and students' self-efficacy enhancement. This can also be explained by referring to other factors that might push self-efficacy, such as extensive learning and mastery experiences of individuals (Loo & Choy, 2013).

We also observe no changes in metacognitive regulation and no significant interaction with changes in learning performance. This findings is in contrast with studies set up in higher education where a significant increase in metacognitive regulation could be observed due to RPT (De Backer et al., 2012a). But the latter study involved first-year students, maybe more easy to influence as compared to second year students that might have adopted an established metacognitive regulation profile that is less easy to change. Kremer-Hayon and Tillema stated already in 1999 that conditions to implement metacognitive regulation are not always favourable and that this also requires more extensive considerable demands on the organization and curricula of teacher education. The current experience might have been too restricted considering the particular setting of the research in one course of the final ITE year.

Though the students sounded very enthusiastic in their responses to open ended questions - focusing on intrinsic motivation - we did yet not observe significant changes in this student teacher cognition, nor did we observe a mediating impact on changes in learning performance.

Also other studies did not find such changes in ITE (Cheng & Ku, 2009). Again, we can refer

to the too small nature of the study to be able to boost intrinsic motivation. In addition, the naturalistic setting of the ITE research did not change to overall nature of student assessment outside the research context. Pakistan teacher education is strongly exam driven. Changing the setting of one particular course (English Teaching) might – yet – not have strongly impacted critical motivational variables, such as autonomy, belonging, and competence. In addition, our findings confirm that researchers often find ambivalence regarding student motivation in student teachers (Cheng, Tang, & Cheng, 2015).

The qualitative data – though collected from a small number of students – reflected first of all a very positive appreciation and positive reflections as to the expected impact on learning performance. These findings are in line with other research, mentioned above. But the respondents also point at some critical issues: tutors might be too authoritative. These findings are in line with studies stressing respondents' dislike of their tutors, setting e.g., unnecessary work (Cheng & Ku, 2009). These tutors seemed to replicate the traditional authoritative teaching style of teachers in Pakistan ITE. This so called 'teacher-centred' approach seemed to transfer from teacher educators to peer tutoring interactions (Shahzad et al., 2015). This stresses how student teachers' adoption of collaborative or student-centred approaches - such as RPT – might be dependent upon teacher educators' earlier way of teaching and interaction (Donche & Van Petegem, 2011).

The qualitative analysis also introduced some elements student teachers perceive as critical in view of future successful REPT implementations: the use of audio-visual aids in the group work, extra reinforcement for weaker students, more extensive tutor training, mixing weaker and stronger students in heterogeneous groups, and enhancing positive relationships between tutors and tutees. Authors also suggested that heterogeneous group combinations could bring about more positive results (see, e.g., Dioso-Henson, 2012; Topping, 1995). Studies also indicate that a poor rapport between tutors and tutees minimizes a successful implementation of RPT (Ginsburg-Block & Fantuzzo, 1997).

Limitations

The present study reflects limitations. The study was set up involving one sample from one teacher education institute, while focusing on a particular course "teaching of English". This puts forward a research agenda to implement RPT at a wider scale within an ITE and by

involving next to final year students, also novices. This would allow next to cross-sectional analysis also follow up studies and a long-term perspective on the adoption and implementation of related didactical strategies. A second limitation is related to the dominantly quantitative nature of the study. The five respondents were limited and set up post-hoc. Concurrent involvement of students in focus groups, next to an analysis of video recordings could help in data and method triangulation. Third, other – not controlled - student teacher variables could have interfered in the current study; such as student teacher beliefs and their knowledge of a wider range of didactical strategies that interact with collaborative learning.

Implications of the current study

The findings of the current study put forward implications for teacher education and educational policy makers. The positive differential impact of RPT shows how this didactical strategy might enrich the variety of teacher education methods. At a policy level, it introduces the need to screen current teacher education approaches and to check how – next to RPT – a stronger level of congruency and alignment can be achieved. At a more general level, the results put forward an agenda for a training of teacher educators in view of the adoption of a wider range of didactical strategies that model future teaching strategies (Bates, Swennen, & Jones, 2014; De Hei, Sjoer, Admiraal, & Strijbos, 2016).

Conclusion

Nevertheless, this study explored for the first time the differential impact of reciprocal peer tutoring (RPT) in an initial teacher education setting. It helped putting forward interesting and positive results. These results also offer directions for future comparable research. This might contribute to a more effective teacher education in the Pakistan setting in particular and the broader teacher education sector as a whole.

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Appendices

Table 1. Reliability of the scales and subscales

Subscales Metacognitive Awareness	Cronbach's α
Declarative knowledge (6 items): e.g., I know what kind of information is most important to learn	.80
Planning (7 items): e.g., I pace myself while learning in order to have enough time	.88
Monitoring (7 items): e.g., I find myself analysing the usefulness of strategies while I study	.86
Evaluation (6 items): e.g., I ask myself if there was an easier way to do things after I finish a task	.86
Subscales Intrinsic Motivation	
Interest/Enjoyment (7 items) e.g., I would describe this activity as a very interesting	.85
Perceived Competence (6 items): e.g., I think I did pretty well at this activity, compared to other students	.80
Effort/Importance (5 items) e.g., It was important to me to do well at this task	.82
Value/Usefulness (7 items): e.g., I ask myself if there was an easier way to do things after I finish a task	.78
Self-efficacy scale	
(10 items) e.g., I am confident that I could deal efficiently with new and unexpected learning situations	.93

Table 2. Descriptive statistics for Learning Performances (LP) metacognitive awareness (MC), intrinsic motivation (IM) and self-efficacy (SE) as co-variables (N= 48) at pre, mid and post-test level

Variables	Conditions	Pre-test	Mid-test	Post-test
		(N=48) <i>Mean (SD)</i>	(N=48) <i>Mean (SD)</i>	(N=48) <i>Mean (SD)</i>
Learning Performance (Max. 50)	Experimental	7.80 (2.29)	21.95(4.46)	29.90(6.35)
	Control	6.67 (2.57)	19.88(6.12)	20.11(6.54)
MC DK (Max. 20)	Experimental	16.12 (1.83)	16.25(1.21)	16.22 (2.01)
	Control	15.55 (2.77)	16.12(2.65)	14.93 (3.91)
MC Plan (Max. 20)	Experimental	14.85 (1.21)	15.78(1.33)	15.53 (2.01)
	Control	15.19 (2.93)	14.98(3.02)	14.05 (4.07)
MC monitor (Max. 20)	Experimental	15.26 (1.61)	15.59(1.50)	15.56 (2.22)
	Control	15.83 (2.04)	15.64(2.69)	14.45 (3.59)
MC evaluation (Max. 20)	Experimental	16.06 (2.59)	17.07(1.46)	16.95 (1.83)
	Control	16.02 (2.94)	16.34(2.72)	14.61 (3.67)
IM interest (Max. 20)	Experimental	16.54 (1.42)	16.95(1.52)	16.92 (1.70)
	Control	16.44 (2.52)	16.38(2.47)	15.00 (2.95)
IM PC (Max. 50)	Experimental	16.85 (1.66)	17.07(1.98)	16.85 (1.70)
	Control	16.51 (1.95)	16.76(2.03)	15.82 (2.89)
IM effort (Max. 20)	Experimental	16.09 (1.81)	16.47(1.93)	16.23 (2.02)
	Control	16.40 (2.64)	16.11(3.19)	14.92 (3.94)
IM value (Max. 20)	Experimental	16.76 (1.90)	17.04(1.51)	16.57 (1.86)
	Control	16.91 (2.27)	16.94(2.07)	15.79 (2.37)
Self-Efficacy (Max. 20)	Experimental	12.54 (2.43)	13.42(2.77)	13.31 (2.25)
	Control	12.22 (2.57)	12.08(3.46)	11.40 (3.20)

6

General discussion and Conclusion

Chapter 6

General discussion and Conclusions

Introduction and problem statement

In the current dissertation, we reported the findings of three survey studies and one intervention study regarding the adoption of didactical strategies, and related (student) teacher cognitions in secondary school settings and from an Initial Teacher Education (ITE) perspective. We also implemented the evidence-based didactical strategy, i.e., reciprocal peer tutoring (RPT) in the initial teacher education (ITE) context. The latter was inspired by an observed need to pursue congruency in the teacher education setting as to the adoption of didactical strategies. The need for congruent teacher education is seen as a major step to counter the theory-practice gap experienced by graduating and starting teachers (Loughran, 2014).

As explained in the introductory chapter, our focus on didactical strategies intersects with the worldwide adoption of competence-based teacher education frameworks. The adoption and implementation of didactical strategies is considered as one of the most significant elements as to the preparation of future teachers (Smith, Douglas & Cox, 2009; Valcke, 2013). Didactical strategies adoption boost the implementation of teacher competences in teaching settings and also helps achieving the learning objectives (Hmelo-Silver & Barrows, 2006). The adoption of didactical strategies is also linked to the teacher self-orientation and pedagogical beliefs (Ferla, Valcke, & Schuyten, 2008). Studies suggest teacher cognitions play a positive role in the selection and implementation of these didactical strategies (Shahzad, Tondeur, Zulfqar, & Valcke, 2015). Nuthall (2004) criticises in this context heavily available research to counter the theory-practice gap and states explicitly that available research will hardly help filling this gap if research does not set up *“in-depth analyses of the changes that take place in the students' knowledge, beliefs, and skills, and ways of identifying the real-time interactive relationships between these two different kinds of data”*. This reiterates in an alternative way the literature indicating teacher cognitions are often ignored in the preparation of future teachers (Schepens, Aelterman, &

Van Keer, 2007; Valcke, Sang, Rots, & Hermans, 2010). Studies are scarce, focusing on the investigation of the interrelationship of didactical strategies with teacher cognitions i.e., pedagogical beliefs, self-efficacy beliefs, intrinsic motivation and metacognitive awareness etc. While we observe - in in-service and pre-service teachers - a weak adoption of a large variety of - evidence-based - didactical strategies, this is also the case in teacher educators' teaching practices (Valcke, 2013). This means that we already observe a theory-practice gap in the ITE setting. Cheng, Cheng, and Tang (2010) analysed – in the Hong Kong context – conditions in the teacher education setting that might help “closing the gap”. They refer explicitly to the teaching practices experienced in the ITE setting and how “*influences of the teacher education program affected a stronger expansive impact than other constraining impacts*” (ibid, p.99). Interestingly, these authors (Cheng, Cheng, and Tang, 2010) explicitly link these experiences to the way this affects student teachers' cognitions (e.g., student teachers' conceptions of teaching). This observation inspired us to introduce an innovative teacher education didactical strategy in the ITE setting: reciprocal peer tutoring (RPT). The implementation of this evidence-based didactical strategy was expected to enhance – as a particular teacher cognition - metacognitive regulation (de Backer, van Keer, & Valcke, 2012) and also the learning performance of students (Dioso-Henson, 2012; Donche & Van Petegem, 2011; Liu & Devitt, 2014).

We briefly summarised the conceptual framework of the study in the above paragraphs that was extensively explained in the first five chapters of the current dissertation. Next, we explain the research questions of the current PhD and look at how the results of the students help to answer these research questions.

Research questions

In the introduction (Chapter 1) of this thesis, we introduced the general research questions addressed with this dissertation. *What is the current state of the art as to the adoption of didactical strategies in Pakistan? To what extent are teacher cognitions related to the adoption of didactical strategies in Pakistan secondary schools and initial teacher education?*

We addressed this general research question in four studies reported in Chapter 2 through Chapter 5 of the dissertation. For the purpose of more focused studies, the general research question was broken down into the following research questions in Pakistan's context:

- RQ1. What is the current state of the art as to the (perceived) adoption of didactical strategies by (student) teachers?
- RQ2. How is the (perceived) adoption of didactical strategies by (student) teachers related to teacher cognitions?
- RQ3. What is the current state of the art as to the adoption of didactical strategies by teacher educators?
- RQ4. Does RPT as an innovative teacher education strategy, positively influence student teacher learning performance?
- RQ5. To what extent is there an interaction through changes in teacher cognitions in the positive impact of RPT as an innovative teacher education strategy on student teacher learning performance?

These research questions were tackled in four studies. In the next paragraphs, we summarise the main findings of the four studies and how these helped answering the respective research questions. A general discussion of these findings and the development of a general conclusion to underpin the theoretical contribution of this doctoral dissertation and related implications for secondary schools, initial teacher education, teacher educators, policy makers, and curriculum developers and other stakeholders.

Finally, we explain limitations of the study and indicate future directions for the researchers to undertake research. This brings us also to “new” directions that could be set up to meet the challenges of future teacher education – both in-service and pre-service – and the related challenges in teacher educators in the Pakistan setting. At the end, we discuss the final conclusions of our research program.

First study: Secondary school teachers’ adoption of didactical strategies and its interrelationship with teacher cognitions

The first study, described in Chapter 2, is to estimate the current adoption of didactical strategies by secondary school teachers and to explore its interrelationship with teacher teaching self-efficacy beliefs and the pedagogical beliefs. This study pursued two research questions related to *perceived behaviour* and *beliefs* of teachers in the secondary school settings in Pakistan. The first research question ‘*What is the current state of the art as to the*

(perceived) adoption of didactical strategies by school teachers?’ was linked to existing teaching practices in Pakistan secondary schools. Results of the study suggest secondary school teachers were basically aware of their adoption and implementation of varying didactical strategies. But, in fact, their adoption level was low compared to a critical benchmark. School teachers were implementing – at a rather basic level - didactical strategies in the classroom such as: strategies that foster the adoption of learning strategies by learners, strategies to match the teaching and learning activities to student characteristics, strategies to make students actively engaged in the classroom, strategies that centre on effective teaching, strategies that help to organise the teaching activities and strategies to develop the positive classroom climate. These results question the professional status of in-service teachers and how their current weaker adoption level of didactical strategies can be remediated. Considering the size of this macro-level educational problem, solutions cannot be found in setting up isolated small scales initiatives. These calls for national initiatives, such as those addressed in a later section in this concluding chapter. Such initiatives have to respond to challenges related to workload of current teachers; see, e.g., Walton, Nel, Muller, and Lebeloane (2014, p. 319) who build on teachers complaints such as: *“You can train us until we are blue in our faces, we are still going to struggle”*. They also have to meet the way these teachers learn as adults (see, e.g., Köpsén & Nyström, 2015); building on the particular needs in a school context as reflected in locally collected performance indicators (see, e.g., Lai & Schildkamp, 2016); or the systemic nature of teacher professional development (see, e.g., Fishman, Marx, Best, & Tal, 2003).

The second research question *“ How is this (perceived) adoption of didactical strategies by teachers is related to teacher cognitions?”* focuses on the interrelationship between secondary school teachers’ current adoption of didactical strategies and how this is related to teacher cognitions i.e., teaching self-efficacy beliefs and the pedagogical beliefs. The results denote a positive relationship of teacher cognitions with the adoption of didactical strategies. Building on the available literature, we could not find a single study in Pakistan’s secondary school teachers’ context that explored this relationship. In fact, in the context of pre-service or in-service teachers’ training, teacher cognitions are hardly given due consideration (Clarke & Hollingsworth, 2002). The results of this study, involving secondary school teachers (N=395) indicate that decision-making self-efficacy; instructional self-

efficacy and disciplinary self-efficacy beliefs are positively linked with the self-reported adoption/implementation of didactical strategies. In particular, we found how traditional and constructivist pedagogical beliefs were clearly linked with the reported adoption/implementation of didactical strategies.

The findings of the current study are in line with the literature that stress the significance of teacher cognitions in relation to the shaping up of teachers' behaviour (Meijer, Korthagen, & Vasalos, 2009). The current study suggests the inclusion of material (content/teaching) that focuses on and ultimately enhances teacher cognitions and further develops the adoption of didactical strategies. The study also answers the request to set up more research that considers the systemic nature of teacher education and considers teacher cognitions when setting up ITE research (see, e.g., Cheng et al., 2010).

Second study: Student teachers' perceived adoption of didactical strategies and its interrelationship with cognitions

The second study, described in Chapter 3, deals with the perceived adoption of didactical strategies of student teachers and it explores the interrelationship with the student teacher cognitions i.e., pedagogical beliefs and teaching self-efficacy beliefs. This study was based on two research questions related to (intended) *behaviour* and *beliefs* of student teachers enrolled in an initial teacher education (ITE) programme. The first research question "*What is the current state of the art as to (perceived) adoption of didactical strategies by student teachers?*" - is linked to current teaching practices in the initial teacher education institutions. Results of the study suggest that there was an overall weak perceived adoption of didactical strategies by student teachers in ITE. This is critical in view of future teaching practices in schools. Literature suggests that in view of a successful preparation of future teachers, the perceived adoption of student teachers regarding the didactical strategies e.g., learning activity, delivering the course-content, classroom management and the students' involvement in the course etc., must be reasonably high (Eilam & Poyas, 2009; Manuel & Hughes, 2006; Tondeur et al., 2012).

To answer the second research question "*How is this perceived adoption of didactical strategies by student teachers is related to their cognitions?*" - the present study explored this particular relationship on the base of survey data. The results indicated there were a

significant relationship between student teacher cognitions and the perceived adoption of didactical strategies. The importance of cognitions has been overlooked in the initial teacher education in Pakistan and elsewhere, as we could hardly find any study that focus on the student teacher cognitions. Korthagen and Kessels (1999) already referred to this problem while pleading for a more realistic teacher education approach. The results from the respondents (N=250) indicate that decision-making self-efficacy; instructional self-efficacy and disciplinary self-efficacy beliefs were positively linked with varying types of didactical strategies. Similarly traditional and constructivist pedagogical beliefs were also positively linked with the perceived adoption of didactical strategies by the student teachers. This reiterates the central position of varying teacher cognitions when focusing on the adoption of didactical strategies. As observed in earlier studies, this relationship does not imply that only constructivist beliefs are important (see, e.g., Lim & Chan, 2007; Petko, 2012), when linking this type of beliefs to the adoption of innovative teaching strategies and ICT. Also, traditional teacher beliefs are important to explain the adoption and implementation of didactical strategies (see, e.g., Höttecke, Henke, & Riess, 2012, when focusing on science teaching).

Third study: Teacher educators' and student teachers' adoption of didactical strategies

The third study, presented in Chapter 4, deals with the current state of the art as to the adoption of didactical strategies by student teachers and teacher educators. This study reiterated the first and third research questions *“What is the current state of the art as to the (perceived) adoption of didactical strategies by student teachers?”* and *“What is the current state of the art as to the (perceived) adoption of didactical strategies by teacher educators?”* This research question is related to perceived *behaviour* of teacher educators. Results of the study indicate a proven basic level of adoption of a variation in didactical strategies by teacher educators. Although in a comparative aspect, the teacher educators and student teachers were aware of the use of these strategies, both reflected a low adoption level. This is in conflict with the literature pushing a high adoption level of varying didactical strategies, next to a thorough understanding of the subject matter to establish successful teacher preparation (Rots, Aelterman, Vlerick, & Vermeulen, 2007; Tulbure, 2011, 2012).

In comparison, the study reveals that teacher educators' reported adoption level was

somewhat higher as compared to student teachers. Of course, differences can be partly explained by differences in the stakeholder interests reflecting their different responsibilities. The latter might reflect a self-representation bias as often reported in the research literature (see, e.g., Kopcha & Sullivan, 2007; Marsh & Roche, 1997) that often leads to self-fulfilling prophecies (see, e.g., Brophy, 1983; Jussim & Harber, 2005). Nevertheless both the fact the actors report rather low-levels of adoption/implementation and the differences between both actor perspectives, point at the critical position of ITE.

Our finding can be explained by a lack of effective transmission-involvement-engagement related to didactical strategies, knowledge, and skills by teacher educators in the ITE programmes. Results suggest this (knowledge/skills transfer) gap between teacher educators and the student teachers minimises the potential adoption and implementation of a wide variety of didactical strategies. An adequate ITE approach demands that teacher educators' adoption of didactical strategies, selection and implementation of teaching material and lesson planning must match the students' ability (Valcke et al., 2010). The teacher educators should run the learning process in the most easiest and the desired way to achieve the lesson objective (John, 2006; Sims & Walsh, 2009; Zazkis, Liljedahl, & Sinclair, 2009). As such, they replicate themselves the teaching learning situation in future classrooms. This introduces again the earlier discussion about the need for congruent teacher education (Korthagen & Kessels, 1999). Our findings validate as such this recurrent theme in the research literature, but now in the Pakistan teacher education context, and by building on a multi-actor perspective.

The literature suggest that the adoption level of didactical strategies and students' learning performance are interlinked and can be improved through the inclusion of innovative and evidence-based didactical strategies such as: learning through doing activities and collaborative learning strategies such as reciprocal peer tutoring (Day, 2013; Valcke, 2013). The current state of the art situation in Pakistan teacher education programmes suggest that there is a dire need for the training of teacher educators for the implementation of evidence based-didactical strategies so that the student teachers are able comprehending and practising such strategies in the actual classrooms (Shahzad et al., 2015). We will reiterate this topic in a later section. Nevertheless, at this point in the present discussion, we add the fact that the theory-practice problem and the congruency

discussion are not only valid when designing innovative ITE approaches. The same applies when discussing the way we have to involve teacher educators in training approaches. There is a growing concern about the professional status of teacher educators themselves (Murray & Male, 2005; Smith, 2003). It is, therefore, reassuring that research and practices start developing competence frameworks for teacher educators and programmes are being initiated to involve teacher educators in professional development settings (Loughran, 2014; Lunenberg, Dengerink, & Korthagen, 2014).

Fourth study: The differential effect of reciprocal peer tutoring (RPT) on student teachers' learning performance

The fourth study, described in Chapter 5, deals with the exploration of the differential impact of reciprocal peer tutoring (RPT) on student teachers' learning performance and the mediating effects of the co-variables i.e., intrinsic motivation, metacognitive awareness and self-efficacy beliefs. This RPT intervention study was based on two research questions related to the *beliefs* (student cognitions) and actual *behaviour* of student teachers in their initial teacher education (ITE) settings. We put forward two hypotheses for this study:

1. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition.
2. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition, considering the mediating impact of attaining a higher level in intrinsic motivation, an increase in metacognitive awareness and an increase in self-efficacy beliefs.

The pre-test post-test quasi-experimental study was set up in the context of an authentic initial teacher education programme and within the setting of the subject "Teaching of English", involving final years Masters in Education (MA) student teachers ($N=48$). In an experimental condition students studied the topics while adopting a reciprocal peer tutoring didactical approach. The results indicate a positive impact of RPT on student teachers' learning performance. The findings of this study - particularly in the Pakistan context but also beyond - are significant in view of the congruency discussion of ITE approaches. Further, it provides stepping-stones for the curriculum developers, policy makers, teacher education designers, and other stakeholders involved in ITE. For the Pakistan ITE context,

the study is a milestone, considering the scarce literature studying the contextual nature of adequate teaching and learning approaches.

As to the second research hypothesis, no evidence was found underpinning the potential mediating effect of intrinsic motivation, self-efficacy, and metacognitive awareness.

The available literature did already underpin the significant and notable contribution of collaborative learning strategies - such as RPT - on students' learning performance in educational settings (Barkley, Cross, & Major, 2014; de Backer, van Keer, & Valcke, 2012; de Smet, van Keer, & Valcke, 2008; Topping, 1995). As researchers report, peer tutoring has a history of over four decades and consistently reports positive outcomes (Bowman-Perrott et al., 2013). RPT is yet a recent didactical approach being introduced and studied in ITE settings (see, e.g., Eriksson & Player-Koro, 2015; Li & Peters, 2016).

After the completion of RPT intervention, we also gathered open-ended written answers from the focus group, involving five respondents who participated in the experimental research condition. The qualitative results were similar to the findings of the quantitative study. They reported an important impact from the RPT experience. As to the impact on their student cognitions, they reported these were already far developed prior to the intervention and as such did not feel these were boosted by the RPT experience. As such, this indicates there was less room for additional development of these teacher cognitions in either research condition. The respondents were highly satisfied with the implementation and results of the RPT didactical teacher education strategy and were of the opinion that RPT significantly enhanced their learning performance. This reiterates the findings in the RPT literature that reciprocal peer tutoring is beneficial for student interaction in group work, probing questions, dealing with peers, co-learning and sharing the ideas for the better understanding of the learning material (Cheng & Ku, 2009; de Backer et al., 2012; Laal & Ghodsi, 2012; Miravet, Ciges, & García, 2014; Ruys, van Keer, & Aelterman, 2010; Topping & Bryce, 2004; Valcke, 2013). In this RPT study, the focus was on the student teachers and not the teacher educators. As will be explained below, this is a shortcoming of this study. An additional research question could have focused on their congruency experiences, their cognitions and future orientations on RPT in their teacher education practice.

General discussion

The findings – summarised above - can be discussed from a variety of perspectives. We focus, step by step on the following issues:

- Didactical strategies and teacher cognitions
- From teachers to student teachers: the role of teacher cognitions
- The development of teacher cognitions
- The theory-practice gap in teacher education
- Benchmarks, standards, or other mastery level criteria?
- The critical nature of ITE programs
- RPT as a model for new ITE approaches
- Preparing future teachers for the 21st century

Based on our typology of didactical strategies, we studied the current level in the adoption of types of strategies in (1) secondary school teachers (2) student teachers and (3) teacher educators in Pakistan. As such, these studies contribute to the literature when looking for related studies set up in challenging developing countries contexts.

Didactical strategies and teacher cognitions

Our research findings about the low-level adoption of didactical approaches in Pakistan's ITE context provoked the exploration of the issue whether the didactical strategies have any relationship with the (student) teachers' cognitions (teaching self-efficacy beliefs and pedagogical beliefs). This led to an additional research question in studies 1 and 2, while administering additional survey instruments based on (student) teacher cognitions (teaching self-efficacy beliefs and pedagogical beliefs).

The results of studies 1 and 2 point at a positive interrelationship between the adoptions of varying types of didactical strategies and the (student) teacher pedagogical and self-efficacy beliefs. The results of the first study (Chapter 2) indicate that constructive and traditional pedagogical beliefs were positively linked with the six types of didactical strategies. As stated already above, it is remarkable that higher levels in both constructivist and traditional beliefs boosted the adoption of the six types of didactical strategies. This finding was already stated in ICT related research where the integrated use of information and communication technologies was also strongest in teachers with high levels in both

types of pedagogical beliefs (Sang, Valcke, Braak, & Tondeur, 2010). Though it sounds initially strange that also “traditional” pedagogical beliefs have a positive impact, this can be explained. Teachers with well developed traditional and constructivist beliefs can be considered as stronger professionals who are flexible in their selection of didactical strategies. They consider a variety of options before making decisions when pursuing the educational objectives while considering their belief systems. Authors tend to stress the dichotomy between the pedagogical beliefs. This can result in bias and undervaluing the importance of balancing pedagogical beliefs in the complex teaching and learning setting. In technology rich contexts, authors tend to strive for the adoption of learner-centred constructivist pedagogical beliefs and point at mismatches between beliefs and e.g., technology adoption (see, e.g., Liu, 2011). In their study about teacher beliefs and mathematics learning, Staub and Stern, (2002) favour constructivist pedagogical beliefs and could show how a higher adoption level of these beliefs was related to higher achievement in word problems. But this was not found when the learning objectives were related to the acquisition of factual knowledge and computational proficiency. The former does not imply that teachers should stick to one particular dimension in their pedagogical beliefs. It suggests teachers should be sensitive to the nature of the educational objectives at hand. The seminal paper of Richardson about beliefs and teachers gave - already in 1996 - a clear overview of how inflexibility in belief systems of teachers hinder their actions, choices, approaches towards the subject content, attention to be paid to learner differences, the nature of their pedagogical content knowledge, etc. In their study of physics education, Belo, van Driel, van Veen, and Verloop (2014) referred to literature that found how “the majority of teachers “wobbled” in their beliefs about teaching and learning: they possessed both ‘teacher-centred’ and ‘student-centred’ beliefs” (ibid, p. 90). In their study they could show how teachers agreed with both teacher- and student-regulated learning and how teachers were flexible in their position considering the nature of the learning objectives. As such, they found that e.g., a transmission-/qualification-oriented belief was more strongly related to an emphasis on the acquisition of fundamental physics learning objectives. Their results are consistent with the findings of Mansour (2013) who also found this “wobbling” approach, but especially stressed the consistencies between whatever adoption of a belief position and related instructional practices: “Some of the teachers’ beliefs were consistent with their practices, especially the traditional beliefs, while some of teachers’ practices were

conflicted with their beliefs in different contexts” (ibid, p.1230). The same was found in the context of language learning research (see, e.g., Zhang & Liu, 2014). But it has to be stressed that comparing research can be marred by differences in cultural settings in which the studies have been set up. Nevertheless, the research is not univocal as to the relationship between the nature of the beliefs and the related instructional actions. For instance, Chai, Koh, and Tsai (2013, p.659) found: “evidence that constructivist-oriented teachers do support the traditional use of ICT”. We repeat that flexibility seems to be the optimal condition in teacher’s adoption of belief systems.

From teachers to student teachers: the role of cognitions

Also, disciplinary self-efficacy beliefs, instructional self-efficacy beliefs, and decision-making self-beliefs were positively associated with the adoption of didactical strategies. This indicates that teacher cognitions have positive impact on the adoption of didactical strategies on secondary school teachers. These findings urged us to study the same interrelationship in student teachers. In our studies, the same survey instruments of pedagogical beliefs and teaching self-efficacy beliefs were administered to student teachers. Not surprisingly, the results were quite similar as to the previous study. Both the constructivist and traditional pedagogical beliefs were positively linked to a stronger adoption of the six types of didactical strategies. Also, higher levels in disciplinary self-efficacy beliefs, instructional self-efficacy beliefs, and decision-making self-beliefs were positively associated with the adoption of didactical strategies.

The result of the studies 1 and 2 indicates that the (student) teacher that developed a more sophisticated “cocktail” in their pedagogical beliefs and self-efficacy beliefs would adopt maximum types of didactical strategies and vice versa. Also, other researcher – in a developing country context – stressed the importance of such a mixture (Lim, Tondeur, Nastiti, & Pagram, 2014).

The link between cognitions and “intended” behaviour is a predominant theme in many theoretical models in the literature. Whereas we build in the teacher education literature often on the onion model of Korthagen (2004, 2005), alternative models can be put forward. A relevant example is the Theory of Planned Behaviour (Ajzen, 1991). Following this theoretical model, the intentions to carry out a particular behaviour - e.g., the adoption and implementation of a didactical strategy - is influenced by a number of “cognitions”,

such as a teacher's perceived behavioural control. The later cognition is often labelled as self-efficacy. Another cognition is the perceived position of peers, labelled as the "subjective norm" and lastly, the authors refer to attitudes towards the particular behaviour. Recent studies applied the TPB to student teacher's intention to adopt eBooks (Roslina, Fariha, Haslinda, & Fahmy, 2014) or the adoption of mobile learning solutions (Tagoe & Abakah, 2014).

Though not many studies are found applying the TBP model in the context of ITE, the model underpins the theoretical position of the cognition variables in the overall professional orientations of student teachers. The latter repeats the more general finding that hardly studies are available that focus on the exploration of the interrelationship of (student) teacher cognitions with the adoption of didactical strategies in an ITE setting.

The development of teacher cognitions

Literature on teacher cognitions (pedagogical beliefs and teaching self-efficacy beliefs) underpin its significance for the teaching-learning system (Bandura, 1997; Beijaard & Vries, 1997; Hoy, 2000; Pajares, 1992; Woolfolk, Rosoff, & Hoy, 1990; Woolley, Benjamin, & Woolley, 2004). Authors suggest that - to foster the adoption of didactical strategies - related cognitions have to be developed (Desimone, Porter, Garet, Yoon, & Birman, 2002; Desoete & Roeyers, 2006; Donche & Van Petegem, 2011; Valcke, 2013). Authors additionally point out that teacher cognitions are difficult to tackle during future teacher preparation (Valcke et al., 2010). The latter reiterates the plea of Richardson (1996) when she discussed "the role of attitudes and beliefs in learning to teach" (1996, p. 102). She summarises a large body of the literature that repeats consistently how hard it is to change the beliefs of student teacher (ibid, p.110): *"Perhaps the greatest controversy in the teacher change literature relates to the difficulty in changing beliefs and practices. For some scholars, beliefs are thought to be extremely difficult, if not impossible, to change"*. In her review, she stresses how changes can occur (un) systematically through socialization and experience. But she also discusses changes that dependent on the nature of teacher education programs. As to the latter, she clearly points out how related research findings are inconsistent. She repeats how ITE approaches that foster the "reflection" are actually less successful. Together with other researchers she finds that student teachers know quite well how to "speak" the language of what the teacher educators wants to hear (see also,

Korthagen, 2005). In contrast, she summarises more successful research and concludes *“preservice students should have the opportunity to engage extensively in the active exploration of classroom contexts--in written and video-cases, discussions with practising teachers, and field work. This process may promote the first stages in the acquisition of practical knowledge”*. (ibid, p. 123).

The findings in our first three studies (Chapters, 2, 3, 4) were therefore, crucial to decide on the designing and implementation of an intervention study that builds on the former conclusion: engaging student teachers extensively in the active exploration of classroom contexts. This explains the rationale for setting up the intervention study building on reciprocal peer tutoring (RPT) in ITE context.

The theory-practice gap in teacher education

The results of the studies presented in Chapter 2, 3 and 4 reflect an overall low adoption level of didactical strategies in both Pakistan ITE and secondary school contexts. In the first study (Chapter 2), the results show how secondary school teachers hardly adopt an in-depth and do not adopt a large variety of didactical strategies. This stands in sharp contrast to the attention often paid to these didactical strategies during the student teacher preparation programmes in ITE curricula. This is an indicator of a lack of coherence in teacher education curricula and can be interpreted as a clear pointer for a prevailing theory-practice gap in the initial teacher education curricula and teaching approaches (Loughran, 2014). As has been suggested above, we can also link this to shortcomings in the professional development of teacher educators and the lack of provisions in teacher education settings. This has clearly been reported in developed country contexts (see, Darling-Hammond, 2010, when discussing the USA context; or Korthagen & Kessels, 1999, in the Netherlands), but is also a recurrent theme in teacher education in developing countries (see, e.g., Peeraer & Van Petegem, 2011, in Vietnam; or Robinson, 2003, when discussing the situation in South Africa and Hardman, Abd-Kadir, & Tibuhinda, 2012, when focusing on Tanzania). The latter researchers stress the recurrent theory-practice gap, the lack of adequate resources and link this often to the low adoption of particular didactical strategies such as fostering more student talk, integrating new technologies in the classroom or pushing active and collaborative didactical strategies.

The latter discussion can be linked to our third study (Chapter 4), in which we involved

teacher educators from two prominent initial teacher education institutions in Pakistan. The same survey instruments were administered to the teacher educators as to the student teachers, thus allowing a direct comparison between related research variables. The results indicated that though teacher educators actually reported adopting all six types of didactical strategies, this was again at the low-level. As stated earlier, teacher educator adoption level was somewhat higher as compared to the student teachers, but was clearly below the benchmark (defined in Chapter, 2, 3 and 4).

The former is confirmed when looking at the scarcely available research from the same research context. The current picture of ITE programmes shows an adherence to traditional teaching styles. Authors especially stress a strong extent of rigidity in the teachers' behaviour in Pakistan ITE programmes (see, e.g., Dilshad, 2010) and hence (student) teachers resist the adoption of innovative didactical strategies. This immediately results in a domino-effect, such as a lack of focus on addressing the educational needs of diverse learners in the classroom (Dennis & Votteler, 2013). Traditional or teacher-centred teaching approaches do not guarantee accommodating students with differing backgrounds (Misyak & Christiansen, 2012). Teacher educators reflecting a low-level adoption of didactical approaches hardly consider the individual differences, inclusive education and students' ability and aptitude as the main factors to be considered during the teaching process (Rosenfeld & Rosenfeld, 2008; Sleeter, 2001).

The critical nature of ITE programs

Teacher educators base their actions on a specific ITE curriculum. Korthagen, Loughran, and Russell (2006) therefore, address the issue of coherence between teacher educators and ITE programmes. They presented the following seven principles to be acknowledged and fully responded to by teacher educators in teacher education programmes. These principles are related to learning about teaching:

1. involves continuously conflicting and competing demands;
2. requires a view of knowledge as a subject to be created rather than as a created subject;
3. requires a shift in focus from the curriculum to the learner;
4. is enhanced through (student) teacher research;
5. requires an emphasis on those learning to teach working closely with their peers;
6. requires meaningful relationships between schools, universities, and student teachers;

7. is enhanced when the teaching and learning approaches advocated in the program are modelled by the teacher educators in their own practice.

These principles are fundamental as to the professional development of teacher educators to run initial teacher education programmes efficiently and effectively. In our study, reported in Chapter 4, teacher educators' low-level of adoption questions the ability of teacher educators to respond to these seven principles. Authors explain that educators reflecting a low-level adoption of didactical strategies might be less successful in attaining the stated learning objectives (Lunenberg & Korthagen, 2003; Rots & Aelterman, 2009; Valcke et al., 2010). This also hinders teachers' ability to establish a healthy classroom environment (Wubbels, Brekelmans, Brok, & Tartwijk, 2006). A low-level adoption of varying didactical strategies can also be linked to less effective classroom management skills (Yadav, 2011).

A topic, stressed to a lesser extent in this PhD, is the focus on teacher educators' beliefs when adopting particular didactical strategies. The seven principles of Korthagen, Loughran, and Russell (2006) clearly suggest how we might have to make teacher educators' beliefs explicit and that we have to foster their development. Authors stress how this might influence the position of teacher educators as a role model in the ITE setting (see, e.g., Lunenberg, Korthagen, & Swennen, 2007). Others stress how a move from being a teacher to becoming a teacher educator challenges their beliefs (see, e.g., Berry, 2007; Ritter, 2007; Zeichner, 2005).

Benchmarks, standards or other mastery level criteria?

In the former paragraph, we reiterated our finding that the (intended) adoption of didactical strategies was below a benchmark. This introduces a discussion about what minimum mastery or adoption level can be expected from teachers in general and teacher educators in particular. When discussing the results, it was hard to find straightforward benchmarks in the literature to judge the "level" of adoption. This is a recurrent problem in the research and practice-related literature. With the exception of discussions about technology related competences, it is very difficult to find studies that present explicit minimal levels (see, e.g., Kirschner & Davis, 2003; Northrup & Little, 1996). Darling-Hammond (2000) discusses in this context more rigorous standards and points at large differences in standards being

applied when developing and hiring teachers. But when we look at the nature of the standards being discussed, they rather refer to qualification degrees and whether particular subjects have been tackled in the particular ITE curriculum. The same observation can be made when looking at other discussions about these standards. For instance, Valli and Rennert-Ariev (2002) discuss innovations in teacher education standards in the US and adopt a comparative view. In their analysis, they discuss an interesting move away from competency-based curricula that list general lists to more operational standards. But again the authors state “Although it clearly attempts to be behavioural this list includes many items that would need further specification to be directly observed and measured” (ibid, p. 205). On the other hand, the same authors also send a clear message about quality levels. They state that looking for established “external” standards reflects a traditional view towards “mastery” of teaching competences. They advocate an alternative approach along which teacher education institutes contextualise the evaluation of teaching standards. More, in particular, they ask, “Do they call for shared responsibility for assessing the quality of teaching in authentic settings?” (ibid, p. 205). Though this reorientation in the context of evaluating student teacher mastery of specific competencies or standards question a simplistic external benchmark approach, it still repeats the critical need to define upfront the nature of the expected mastery level.

RPT as a model for new ITE approaches

The results of our intervention study (Chapter 5) exemplify how a shift in ITE approaches might be beneficial for students. The direct impact of RPT strategy on student teacher learning performance strengthens the potential of adopting evidence-based didactical approaches in ITE settings. The results also suggest RPT helped developing self-management, cooperation, autonomy, self-discipline and self-confidence in students. Results – building on the small number of open ended answers - indicate that in some groups the student teachers behaviour was autocratic and not friendly and that calls for more intensive training of tutors that is beneficial in enhancing teaching competences.

Though these results are positive, they can also be criticised. The RPT study did not look at how this influenced related changes in the student cognitions studied in the earlier studies. The study did also not focus on the beliefs of the (small number of) teacher educators involved in the study. We will return to this topic when discussing limitations of our studies.

In the following section, we elaborate the contributions of the current PhD in the light of the results and the related discussion presented above.

Preparing future teachers for the 21st century

The results -presented in the current dissertation- are in line with the initial teacher education (ITE) literature that calls for strengthening teacher education in view of the 21st century skills; such as: enhancement of teacher competences, teacher willingness to teach, teacher teaching skills and bridging the theory-practice gap in ITE (Darling-Hammond, 2006; Day, 1999; Korthagen, 2005; Valcke, 2013; Zeichner, 2013). When discussing “*what is lacking in the current teacher practices?*” Hattie (2009, p.109-110) especially points at the lack of adoption of evidence-based strategies in teacher education that goes together with the narrow band within strategies being adopted and the lack of adoption of these strategies by the teacher educators themselves. He criticises the non-data-driven teacher education approaches in the current teacher education programmes are focused on institutes must design such programmes that enable students teachers to understand the curriculum deeply, teaching methodology and dealing with diverse students in a complex classroom. These conclusions are in line with the results of our intervention study, where we focused on collaborative didactical approaches such as reciprocal peer tutoring. So based on our results, we can suggest RPT as the evidence-based didactical approach to be adopted and implemented in ITE curricula.

Many authors suggest initial teacher education programmes should focus on the student teachers’ understanding of the subject matter and the pedagogical preparations since these are considered the core responsibilities of teacher educators (Darling-hammond, 2000; Lunenberg, Korthagen, & Swennen, 2007; Rosenfeld & Rosenfeld, 2008; Rots & Aelterman, 2008; Valcke et al., 2010). Teacher educators are supposed to be the role models for student teachers. The teacher educators’ low-level adoption of didactical strategies would reappear in student teachers (Shahzad, Tondeur, Zulfqar, & Valcke, 2015).

ITE for the 21st century does – at this stage – yet not bridge the gap between policy aims and reality in classrooms (Allen & Wright, 2014). New perspectives on student teacher competences are especially focused upon in initial teacher education policy documents but has yet not fully been implemented in actual teaching practices (Korthagen, 2010; Shahzad et al., 2016). This questions whether current student teachers are fit for 21st-century

classrooms (Pfitzner-Eden, 2016). The results of the studies (1-4) add doubt as to this readiness.

Contributions of the current PhD

The present study in Pakistan context is very significant as it contributes to various fields of research. Below we explain theoretical, methodological, and practical contributions of this PhD.

Potential theoretical contributions

Didactical strategies and teacher cognitions

The results of studies show that teacher cognitions are positively linked to the adoption of didactical strategies. These findings reinforce theoretical models that help explain this particular relationship. Next to the TPB model discussed above, we present in this context the cyclic model of self-efficacy as developed by different authors (see, e.g., Tschannen-Moran, Hoy, & Hoy, 1998, p. 228) that is at its core based on the social cognitive theory of Bandura (1986). The cyclic model of self-efficacy explains how self-efficacy is a source that is linked to cognitive processing that accelerates teacher competences. This is depicted in the following figure.

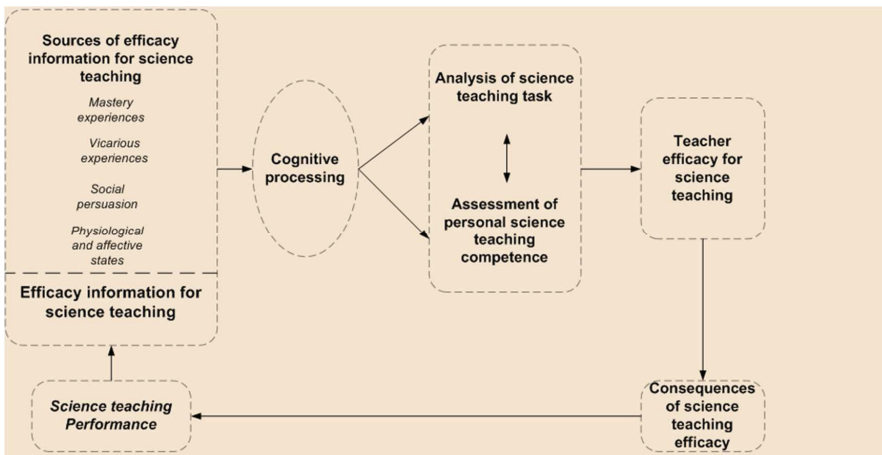


Figure 4. Cyclic model of self-efficacy (based on Tschannen-Moran et al., 1998, p. 228)

Whereas the above model looks at science teaching, the results of the present study add evidence from a different educational setting in Pakistan secondary education.

The feedback loop in the above model was less clear when looking at the results of the RPT intervention. But as already stated above, we did not study consistently the same cognitions as compared to the earlier studies. The student teacher cognitions in the latter study were not linked to the adoption of the didactical strategy. Though the students sounded very enthusiastic in their responses - focusing on intrinsic motivation - we did yet not observe significant changes in student teacher cognitions, nor did we observe a mediating impact on changes in learning performance. The latter is not in line with studies set up in higher education context where a significant increase in metacognitive regulation could be observed due to reciprocal peer tutoring as a didactical strategy (De Backer et al., 2012). But the latter study involved first-year students, maybe more easy to influence as compared to second-year students that might already have adopted an established metacognitive regulation profile that is less easy to change. Kremer-Hayon and Tillema stated already in 1999 that conditions to implement metacognitive regulation are not always favourable and that this also requires more extensive considerable demands on the organization and curricula of teacher education. The current experience might have been too restricted considering the particular setting of the research in one course of the final ITE year.

Peer tutoring in ITE settings

In our study about RPT, we found a direct impact of RPT on student teacher learning performance. This reinforces the theoretical claims presented in the literature (De Backer et al., 2012a; De Backer, Van Keer, & Valcke, 2015; Rittschof & Griffin, 2001; Topping, 1996). It has to be stressed that this collaborative didactical approach – though challenging - was new for the student teachers in Pakistan context. In the qualitative analysis, we found evidence to support the positive results. Student teachers supported the implementation of RPT in their ITE context. The results help to position RPT as a promising didactical strategy for initial teacher education. The theoretical assumptions as to the positive impact of this

collaborative learning strategy seem to hold also in this context. As stated in Chapter 5, RPT research is hardly found in ITE settings. The results therefor underpin the theoretical position of RPT for this particular higher education setting.

Methodological contributions

Didactical strategies adoption instrument

As to the methodological contribution of the current PhD, we emphasise the development of the didactical strategies instrument, based on typology of didactical strategies presented in the observation instrument of Van de Grift (2007). This typology of the didactical strategies was explained in more detail in the former chapters where we linked each “type” of didactical strategy to the literature. Furthermore, we compared this typology with classifications developed by other authors (see, e.g., Horng et al., 2005; Westwood, 2008; Trees, 2013; & Perrott, 2014). The resulting self-report survey instrument appeared to be valid and reliable and could be applied in a variety of settings. Future research can implement this instrument and compare their findings with other measures pointing at the adoption of didactical strategies or with the findings in the present dissertation.

Intervention study materials

The development of the materials in view of the implementation of reciprocal peer tutoring inventory is a contribution for further studies in ITE settings. In these materials, we elaborated the mechanism of RPT, training materials for tutors, the way to prepare tutoring session cards, learning performance tests and a series of strategies to invoke active participations of peers. In the literature, it is difficult to get access to comparable materials that help to set up research. The book of Falchikov (2001) was helpful in this setting, but did not focus on teacher education in particular. We hope researchers will check the now available materials for future RPT in actual ITE settings. The materials also exemplify guidelines for further curriculum development.

Practical contributions

In the following paragraphs, we explain the practical contribution of the PhD study with reference to secondary school teaching, initial teaching education, teacher educators, and Evidence-based didactical approach (RPT). These contributions address different stakeholders, considering their role and responsibilities.

The secondary school teaching sector

Our findings reconfirm the importance of teachers' cognitions in the educational context. The results point at the critical situation in Pakistan secondary education when it comes to the types of didactical strategies being adopted. The study put forward substantial implications for the in-service teachers in the secondary school system of Pakistan. First, the results suggest there is a dire need for implementing - standard-based - professional development programmes for the in-service teachers in Pakistan. There is also a need for monitoring the didactical approaches of Pakistan secondary school teachers. In both contexts, the definition of clear standards and benchmarks would be helpful to point at critical strengths and weaknesses. Additionally, the results can inspire curriculum developers to upgrade didactical support materials; and push policy makers and school principals to join hands in developing a professional school community to rethink the school-learning environment. Taking into account the findings regarding the impact of teachers' cognitions, policy planning, curriculum development and teachers training must be given due weightage to address the importance and nature of these cognitions. Experiences, such as the approach of Chan (2008) reflect that secondary school teachers' cognitions can be developed by extensive in-service professional development programmes. These programmes should cater for the bridging of theory-practice gaps in the schools and eventually in the real classroom settings.

The initial teacher education sector

The findings of the current PhD present significant implications for Pakistan initial teacher education (ITE). The results call for congruency in the way teacher educators teach their students and how ITE mirrors and models the variety of didactical strategies in the teacher education itself. The results also suggest a critical need for the continuous professional development of Pakistan teacher educators. Following this agenda, teacher educators should adopt of a wider range of didactical strategies to model future teaching strategies (Bates, Swennen, & Jones, 2014; De Hei, Sjoer, Admiraal, & Strijbos, 2016). This professional development path is suggested by many contemporary authors (see, e.g., White, Bloomfield, & Cornu, 2010). Teacher educators should be continuously challenged as to their knowledge base about didactical strategies and their teaching competences. Building

Shulman's PCK model (186, 1987), their pedagogical and content knowledge of teacher educators should be challenged. The research results also suggest a need for developing “benchmarks” as to the current quality of Pakistan teacher education. The current study could serve as a baseline study to develop such benchmarks. Curriculum developers and educational policy makers could put forward standards to inspire such benchmarking exercises on a regular base; but considering the critical remarks rose earlier about the nature of such standards. Next to the focus on didactical strategies, the ITE sector should also considering the findings in relation to the critical development of student teacher cognitions. We can repeat in this context the remarks of Richardson (1996) as to pathways to influence these cognitions. The former also enhances – next to a focus on teacher educators themselves – a discussion about the nature of the ITE curriculum. Again, we can repeat what Richardson (1996) put forward as critical dimensions of an effective ITE program, next to the seven principles to establish an effective ITE curriculum of Korthagen, Loughran, and Russell (2006)., discussed above.

Policy makers

The findings of the current PhD put forward implications for policy makers. The research results introduce the need to screen current teacher education approaches and to check how a stronger level of congruency and alignment can be achieved. It has to be mentioned in this context that quality assurance approaches are relatively new to the Pakistan higher education context. Though related discussions started already in the early years 2000, an established system with procedures, protocols, and institutions has yet not been put in place (Batool & Qureshi, 2007; Memon, 2007). Policy makers could also put forward more strict quality criteria when hiring teacher educators and/or put a professional development system in place.

Limitations of the studies and directions for future research

In this section, we outline the limitations of the studies that might have affected the results and eventually minimise the generalizability of our findings. These limitations are related to the research methodology, a narrow actor focus, and the nature of the research samples, the research instruments, the actual research design, the analysis approaches, and the intervention approach. Directions for future research are linked to these limitations.

1. A first limitation is related to the research methodology. We adopted survey instruments in all studies to collect data, with the exception of focus group open-ended written answers, set up alongside the intervention study. Though the actual adoption of didactical strategies is always difficult in an ITE setting, alternative methods could be adopted in the actual school setting when studying in-service teachers. Qualitative methods, such as classroom observation, stimulated recall interviews and in-depth interviews could substantiate the current research findings. For this purpose, a mixed method research approach including qualitative and quantitative methodology may be adopted in future studies. In order to develop a more in-depth understandings and application of the current findings, studies have to be set up in the Pakistan ITE setting, while involving curriculum developers, policy makers, head teachers, teacher educators and student teachers.
2. In the present studies, a multi-actor perspective was lacking. We always focused on individual student teachers and individual teachers. But the choices of these (student) teachers do not always depend on their individual position, and might be related to classroom and school culture, school policies, etc.
3. As to the second limitation, the sample was too small to represent Pakistan's teacher education and the entire secondary school population. This affects the generalizability of the findings of the current PhD study. All research was up in the Punjab province. Though this is the most populated province in Pakistan, the results might be context-linked. Also, we focused on schools and institutions in major cities. The results can therefore, not be generalised to other schools and regions. Future research should develop a more elaborated sampling framework.
4. Next, we heavily relied on research instruments, materials, and approaches adopted in Western educational settings. Though the research instruments were validated in the Pakistan context, we can still question whether the focus on the typology of didactical strategies fits the particular cultural and geographical context. For instance, our focus on constructivist, student-centred pedagogical beliefs could be criticised. Fuller (2010) and Tabulawa (2003) uncover how implicit drivers might introduce pedagogical ideologies that are less suitable for a given context. But even when we move beyond ideological differences, the context of developing countries puts forward other constraints. Glewwe and Kremer (2006) analyses how decision in developing countries are strongly

constrained by resource limitations in terms of teacher salaries, infrastructure, teaching resources, etc. This affects in a direct way the feasibility to opt for a large variety of sophisticated didactical strategies. The former applies also in general to the prevailing focus on school effectiveness research in the Asian context (see e.g., Cheng & Wong, 1996). The former is in particular true while focusing on teacher cognitions (pedagogical beliefs, self-efficacy beliefs, intrinsic motivation and metacognitive awareness). These were relatively new concepts for the teacher educators, student teachers, and secondary school teachers. Respondents perceived these cognitions in their particular cultural settings. The literature stresses how teacher cognitions are rooted in the cultural context and are developed in this context over a period of time (see, e.g., Chan, 2004; Chan & Elliott, 2002).

Future research should therefore; start from a contextualised perspective of didactical strategies that – though it might push some constraints – better fits the Pakistan context. Developing or redeveloping “local” instruments might also help to push an ITE research tradition in the Pakistan context. This fits the more general call for more context-specific problem solving in developing countries in a variety of societal domains (Babaci-Wilhite & Geo-Jaja, 2014; Behague, Tawiah, Rosato, Some, & Morrison, 2009; Heyneman, 1987). Also, cross-cultural studies are recommended to study international similarities and differences in teacher cognitions and the adoption of didactical strategies.

5. A fifth limitation is regarding the lack of established standards to judge e.g., adoption levels of didactical strategies. We already elaborated this topic above and indicated we could not find clear-cut standards in the literature. Thus, we focused on the mastery learning literature that suggest that at least a person’s mastery is considered if he/she reflects an 80% mastery. This criterion can be criticised as being arbitrary. Also, building on the earlier discussion and reorientations in the competency and standards discussion in teacher education, local definitions of these standards might be needed.
6. The sixth limitation of the study is linked to the intervention study. The study was set up involving one sample from one teacher education institute, while focusing on a particular course “teaching of English”. This puts forward a research agenda to implement RPT at a wider scale within an ITE and by involving next to second-year students, also novices. This would allow next to cross-sectional analysis also follow up

studies and a long-term perspective on the adoption and implementation of related didactical strategies. A second related limitation stresses the major quantitative nature of the study. The five open-ended written answers were limited and set up post-hoc. Concurrent involvement of students in focus groups, next to an analysis of video recordings should support to establish data and method triangulation. Also, other – not controlled - student teacher variables could have interfered in the current study; such as student teacher beliefs and their knowledge of a wider range of didactical strategies that interact with collaborative learning. The latter was already addressed in this concluding chapter. Whereas the focus on student teacher cognitions was linked to the adoption of a typology of didactical strategies, the focus in the intervention study shifted to the impact of a particular didactical strategy (RPT) on learning performance and the mediating impact of student teacher cognitions. Lastly this study could have been, enriched by studying teacher educator's perspectives (cognitions) about RPT.

7. The seventh cluster of limitations is of a theoretical nature. In fact, we did not study a full range of teacher cognitions. We tackled four (student) teacher cognitions, dominantly discussed in the literature and that are being linked to the adoption of didactical strategies: self-efficacy beliefs, pedagogical beliefs, intrinsic motivation, and metacognitive awareness. Also, taking into account the onion model (Korthagen, 2004), we did not study the alignment of teacher cognitions with the environment, identity, and mission as additional layers of the model, next to our focus on (intended) behaviour and beliefs.
8. Lastly, we studied the adoption of didactical strategies somewhat isolated from other competence elements (knowledge and attitudes). In the introductory chapter we presented these didactical strategies as crosscutting skills. But "knowledge" about these strategies is also critical in view of their adoption. Our observation that respondents in our studies were e.g., not acquainted with RPT as a didactical strategy is a clear indicator that adoption of strategies requires a full perspective. We also put didactical strategies isolated from one another; neglecting their interrelated nature. Authors stress the holistic and interrelated nature of teacher competences (see the model of Tschannen-Moran).

Going beyond the current PhD: boosting teacher educators and teachers' quality in the Pakistan context

In the former sections and paragraphs, our reflections built on our research results and the related literature. In this section, we go beyond this information base and present new directions for Pakistan teacher education that also go beyond the constraining boundaries of the PhD related choices. The findings of the current dissertation clearly indicate there are incongruences in the adoption of didactical strategies in teacher education in Pakistan and it also reflects the theory practice gap. The similar situation is unveiled in the in-service teachers in Pakistan's secondary school context. Though our research was based on relatively small samples, inconsistencies in teacher education and in-service teacher training are clearly observed. The results of the current PhD are therefore challenging at theoretical, practical and policy-making level in Pakistan. There is a dire need for a fundamental revision of teacher education policies, curriculum development, and the mechanisms underlying teacher education (for pre-service and in-service teachers) in the country. In our implications of the studies, we consistently pleaded for more research, alternative approaches, larger samples, more institutes, and so on. But is this a valid approach?

In Pakistan, initiatives are being taken by the Ministry of Education, heads of initial teacher education (ITE) institutes, and heads of secondary schools in Pakistan. But is this enough? The scale of the undertaking is that large that we question whether the "bits-and-pieces" approach, reflected in current activities is adequate. We dare to say a fundamental shift is needed, starting with way stakeholders think about innovation in these sectors. To start a fundamental change, the present researcher himself wants to play an active role in uplifting teacher education in Pakistan. For this purpose, the researcher has decided to establish a centre namely 'Developing Teacher Education in Pakistan' (DTEP) with the motto "*teach as you preach*" to enhance teaching competences in teacher educators and in-service teachers. Examples of such centres do exist; e.g., Teacher Education Programme (TEP) at school of Education, at Harvard University USA, Peen GSE Teacher Education Programme, USA, Ontario Teacher Education Programme, Canada, Teacher Education and Professional Learning Research Group (TEPLRG), UK and so forth.

Also, programmes focusing on teacher educators do also exist; e.g., The Association of Teacher Education in Europe (ATEE), International academy of Education (IED) arranges such activities that focus on the professional development of teacher educators.

Since in a second phase, the newly educated expert teacher educators will start working with schools, we can also build on examples of institution partnerships in view of professional teacher development (see e.g., NYU Partnership School Program, Teacher Quality Partnership Grant Program, USA, and University of Indianapolis School Partnerships Programme etc.

In the next paragraphs, we elaborate the mechanism of this DTEP in more detail.

The centre “Developing Teacher Education in Pakistan’ and the TEACH_P+ programme

To meet the challenges of teacher education in the 21st century, as proposed, we would like to establish the centre for Developing Teacher Education at the Islamia University of Bahawalpur (IUB), Pakistan. IUB is located in the middle of the south Punjab. It is an under-developed area and is in a situation clearly in contrast with big cities like, Islamabad, Lahore, and Karachi. This centre would start catering for the needs of three universities i.e., Islamia University of Bahawalpur, Bahauddin Zakariya University Multan, and Ghazi University, Dera Ghazi Khan. At a later stage, the centre would move to other areas, and other provinces; among these the more remote provinces such as Sind, and Baluchistan. The main function of this DTEP centre would be to launch a train-the-trainer programme for teacher educators. In the context of this chapter, we label this as the TEACH_P+ programme. This programme focuses on the professional development (PD) of teacher educators. Opting for a focus on training trainers is based on the observation the country is too large and that the train-the-trainer approach would be more effective in view of dissemination, scalability and feasibility. It is expected to have a “spread like oil” impact.

Building on the current PhD, the TEACH_P+ would take into account the critical development of related teacher educators’ cognitions (self-efficacy, pedagogical beliefs, intrinsic motivation and metacognitive awareness) and teaching competences (knowledge, skills and attitudes). Authors reiterate all these interrelated objectives play a vital role in the shaping up of an effective teacher (Vanderlinde, Tuytens, De Wever, & Aelterman, 2016). Also, Zeichner (2012) suggests, “once the activities of teachers are identified, the curriculum of teacher education programs should focus on preparing teacher candidates to

know and do these things. Teachers should be evaluated on how well they know and do them rather than on completion of certain required courses” (ibid p. 377). Critical is that these expert teacher educators would be responsible for establishing ITE institution and school linkages to boost the professional development of in-service teachers.

The DTEP centre will focus on the target group: develop teacher educators in respect of the development of particular teaching skills through “evidence-based teaching approaches” (Valcke, 2013). Through the evidence-based approaches, teacher educators will come to know and experience the significance of “teach as you preach” (Struyven, Dochy, & Janssens, 2010). They actively adopt and demonstrate the didactical approaches experienced during their training programmes. In this context, our typology of didactical strategies becomes important since it points at the full variety of related knowledge, skills and attitudes teachers have to adopt. The teacher education programme will for instance enable the teacher educator to develop capabilities to be able managing differentiated instruction in the classroom (Ruys, Defruyt, Rots, & Aelterman, 2013).

An additional dimension in the DTEP centre, is the teacher educators’ involvement in research activities to underpin their professional development (Lunenberget al., 2014). In the training programme, the personal engagements of teacher educators at a cognitive, affective, and behavioural level will ensure they will promote teaching competences, but also follow up the efficacy and efficiency of their own approach (Tack & Vanderlinde, 2014). Further, the involvement of teacher educators in a professional learning communities (PLC) will be helpful in exchanging ideas regarding effective teaching in the classroom as PLC is considered a powerful tool of bringing positive change in teachers (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). Thus far, teacher educators have been observed to be too much individuals; reflecting the very individualized nature of the teaching job in Pakistan classroom (Dilshad, 2010).

The operating mechanism of DTEP centre

As to the operating mechanism of teacher educators’ education programme, first of all, the curriculum for the whole training programme would be developed keeping in view the local needs, cultural variables, level of difficulty and all related factors. Building on the current PhD, the focus would be on evidence-based teaching and learning approaches. In a start-up phase, international experts would be engaged in designing and developing the teacher

education programme. But, as stressed earlier, the local needs and setting are critical. Therefore, the target group would also become “teachers as designers” of a growing body of materials, solutions, and tools, resources that could be shared in the Centre and through online solutions. In terms of the curriculum, we repeat the focus on establishing ITE institution-schools relationships to foster the professional development of in-service teachers. The latter will e.g., require the expert teacher educators will learn applying needs analysis approaches.

The duration of the programme would be settled with the mutual consents of the experts and participants together with the approval of the institutions. Considering the focus on cognitive, affective, and behavioural changes in the target group, the initial option is to go for a semester type programme. Also, given the need for follow-up of professional development, we envision that the target group would be involved in activities taking place in their own professional setting; mostly via online tools (uploading cases, collaborative solution of new cases, developing a shared database of problems, lesson packages, tools, resources, data... The localized setting of part of the training is needed; especially with a focus on professional development of in-service teachers in mind.

Next to face-to-face approaches to set up the programme, the centre would also develop distributed approaches to develop the needed capacities: online, computer supported collaboration, online video-clips of cases ...

Teacher education institutes would be asked to send teacher educators from their institute to be developed as a “master-trainer”. The expert would complete the education programme and become certified as such. After completion, certified master trainers go back to their parent institution to train his/her colleagues. In this way, also other teacher educators in the country would get access to the latest evidence-based teaching approaches. The master trainers would be able to build on the growing online resources to develop their own professional development position in the teacher education institutions and/or schools. This would also allow teacher educators to align their teaching approaches to the demand and needs of the particular (student) teachers in their school and ITE context.

These teacher educators - in the next step - would establish collaborations between the ITE institution and local schools to boost the professional development of in-service

secondary school teachers. Since a lot of activities in an ITE institution build on contacts with local schools, these contacts would be the base for “development contracts”. The focus of these in-service programmes will have to consider the challenging nature of the current school system. Therefore priorities will be different, dependent on the local setting. For instance, secondary school teachers in Pakistan are using out-dated didactical practices related to classroom management and e.g., still adopt corporal punishment (Kanu, 2005). In many rural areas, secondary school teachers do not adopt student-centred didactical strategies (Shahzad, Valcke, Tondeur, & Zulfqar, 2016a). Priorities in the collaboration will depend on a critical need analysis. This reiterates the need to design the teacher educator curriculum with these requirements in mind. Also, the in-service teacher professional development programme has to consider the needs of rural areas. This is why we initially position the DTEP centre outside the big city areas.

Currently, building on the efforts of the Government and the educational institutions in the country, a new ITE curriculum has been designed for the pre-service teachers, resulting in a four-year BEd (Hons) programme; replacing the previous one-year B.Ed programme. Many efforts have been made to revolutionise the related curriculum, incorporating innovative activity-based learning materials. Currently, this curriculum has been launched, but hardly affects the reality of the classroom. As stated earlier in this PhD, teacher educators rather “talk” about innovative practices and hardly “walk” the practices. For the purpose of the TEACH_P+, we would build on the revised curriculum, but it would be revised (see above) with the concept “teach as you preach” in mind and considering the focus on the additional responsibilities of these teacher educators.

Final conclusions

Building on the different chapters and the present discussion, we present the following conclusions that can be taken away from the current PhD:

- (1) Currently there is weak perceived adoption of didactical strategies by school teachers, student teachers, and teacher educators in the Pakistan secondary school and ITE setting.

- (2) Student (teacher) cognitions (self-efficacy beliefs and pedagogical beliefs) are significantly linked to the adoption of didactical strategies; thus pointing at the significance of developing teacher cognitions when preparing future teachers.
- (3) Teacher educators also reflect a low-level adoption of the six types of didactical strategies. Their adoption level is similar to that of student teachers, and secondary school teachers.
- (4) Implementing an evidence-based didactical approach (RPT) in the ITE setting has a direct positive impact on student teacher learning performance.
- (5) Student teacher cognitions (self-efficacy beliefs, metacognitive awareness and intrinsic motivation) are not automatically influenced when adopting RPT in the ITE setting.

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Appendix A:

Research Instruments

Dear Teachers,

This questionnaire is designed to help us gain a better understanding of the kind of things that create difficulties for teachers in their institutional activities. Please indicate your opinions about each of the statements. Your answers will be kept strictly confidential and will not be identified by name. **For students studying** in (B.Ed, M.Ed, M.A Education, etc), they can use their future perception of teaching and can fill out the questionnaire, as they are not practicing as a teacher yet.

Best regards,

Abid Shahzad
 PhD student
 Department of Educational Studies
 Ghent University, Belgium

Prof. Dr. Martin Valcke
 Promoter/Research supervisor
 Department of Educational Studies
 Ghent University, Belgium

Please Tick (✓) the relevant boxes: Institute name

Gender: Male Female **Qualification:** Bachelor Masters MPhil PhD

Teaching Experience: No experience 1-5year 5-15 years More than 15 years

Teacher pedagogical beliefs scale

Respond to questions below by using the following rating scale:

1.Strongly Disagree 2.Disagree 3.Undecided 4.Agree 5.Strongly Agree

Sr. No	Statements	1	2	3	4	5
1	I believe that expanding on students' ideas is an effective way to build my curriculum.					
2	I prefer to cluster students' desks or use tables so they can work together.					
3	I invite students to create many of my bulletin boards.					
4	I like to make curriculum choices for students because they can't know what they need to learn.					
5	I base student grades primarily on homework, quizzes, and tests.					
6	To be sure that I teach students all necessary content and skills, I follow a textbook or workbook.					
7	I teach subjects separately, although I am aware of the overlap of content and skills.					
8	I involve students in evaluating their own work and setting their own goals.					
9	My primary role as a teacher is to help students					

Appendix A

	become learners, not to teach particular content knowledge.					
10	I make it a priority in my classroom to give students time to work together when I am not directing them.					
11	I have centers in my classroom that students can work at, but only after their assigned work is finished.					
12	During discussions I ask many open-ended questions and encourage students to ask questions of each other.					
13	My students spend the majority of their seatwork time working individually.					
14	For assessment purposes, I am interested in what students can do independently.					
15	One way I get my students ready for the next activity is to compliment students who have followed my directions quickly.					
16	Instead of assigning students jobs, I encourage them to show initiative in helping keep our classroom neat and clean.					
17	I generally use the teacher's guide to lead class discussions of a story or text.					
18	I prefer to assess students informally through observations and conferences.					
19	I find that textbooks and other published materials are the best sources for creating my curriculum.					
20	If students are interested in a topic I try to help them, but I don't use class time because I have a lot of curriculum to cover.					
21	I am a firm believer in paper-and-pencil tests.					
22	I often create thematic units based on the students' interests and ideas.					
23	Students need to learn that there are consequences for inappropriate behavior.					

Appendix A

	the institute	
Efficacy to Create a Positive School Climate		
	Make the institute a safe place	
	Make students enjoy coming to the institute	
	Get students to trust teachers	
	Help other teachers with their teaching skills	
	Increase collaboration between teachers and the administration to make the institute run effectively	
	Reduce the institute dropout	
	Reduce the institute absenteeism	
	Get students to believe they can do well in the institute work	

Teacher didactical strategies scale

Respond to questions below by using the following rating scale:

1.Strongly Disagree 2.Disagree 3.Undecided 4.Agree 5.Strongly Agree

Sr. No	Statement	1	2	3	4	5
1	I ask students to think about solution strategies					
2	I encourage critical thinking of students.					
3	I teach students how they can simplify complex problems.					
4	I encourage students to think aloud.					
5	I allow students to check their solutions.					
6	I encourage the use of control activities					
7	I promote the application of what has been learned					
8	I ask questions that encourage students to reflect on what has been learned.					
9	I ask students to think about the strategies to tackle a problem.					
10	I look for bridge the differences between learners and what they are expected to learn.					
11	I provide extra instructional time and learning time to weaker students					
12	I encourage self-confidence in weaker students					
13	I provide in interactive instructional methods and strategies					
14	I use instructional strategies that activate students					
15	I involve all students in the class activities					
16	I promote that students do their best					
17	I give clear explanations about the subject matter					
18	I give clear explanations about the use of tools and tasks					
19	I ensure that students have understood the learning content during the instruction					
20	I provide feedback to the students					
21	I check whether the lesson objectives were attained					
22	I give well structured lessons					
23	I clarify the learning objectives at the start of the lesson					
24	I focus on effective instructional time management					
25	I promote effective classroom management					
26	I check – during activities - whether students performed the tasks in a proper way					
27	I ensure that the lesson is conducted in an orderly way					
28	I promote mutual respect among students					
29	I boost the self-confidence of the students					
30	I provide a relaxed atmosphere.					
31	I show respect to the students through his/her behavior and language					

Metacognitive awareness scale

Respond to questions below by using the following rating scale:

1.Strongly Disagree 2.Disagree 3.Undecided 4.Agree 5.Strongly Agree

Sr. No	Statements	1	2	3	4	5
Declarative knowledge						
1	I understand my intellectual strengths and weaknesses					
2	I know what kind of information is most important to learn					
3	I am good at organizing information					
4	I know what the tutor expect me to learn					
5	I am good at remembering information					
6	I learn more when I am interested in the topic					
Planning						
7	I pace myself while learning in order to have enough time					
8	I think about what I really need to learn before I begin a task					
9	I set specific goals before I begin a task					
10	I ask myself questions about the material before I begin					
11	I think of several ways to solve a problem and choose the best one					
12	I read instructions carefully before I begin a task					
13	I organize my time to best accomplish my goals					
Monitoring						
14	I ask myself periodically if I am meeting my goals					
15	I consider several alternatives to a problem before I answer					
16	I ask myself if I have considered all options when solving a problem					
17	I periodically review to help me understand important relationships					
18	I find myself analyzing the usefulness of strategies while I study					
19	I find myself pausing regularly to check my comprehension					
20	I ask myself questions about how well I am doing while I am learning something new					
Evaluation						
21	I know how well I did, once I finish a test					
22	I ask myself if there was an easier way to do things after I finish a task					
23	I summarize what I've learned after I finish					
24	I ask myself how well I accomplished my goals once I'm finished					
25	I ask myself if I have considered all options after I solve a problem					
26	I ask myself if I learned as much as I could have once I finish a task					

Intrinsic motivation scale

Respond to questions below by using the following rating scale:

1.Strongly Disagree 2.Disagree 3.Undecided 4.Agree 5.Strongly Agree

Sr.No	Statements	1	2	3	4	5
Interest/Enjoyment						
1	I enjoy doing this (peer tutoring) activity very much					
2	This activity is a fun to do					
3	I think this is not a boring activity					
4	This activity will hold attention to great extent					
5	I think this activity is quite enjoyable					
6	During this activity, I am to think how much I enjoy					
7	I describe this activity as very interesting					
Perceived Competence						
8	I think I am pretty good at this activity					
9	I think I am pretty well at this activity, compared to other students					
10	After getting to know about this activity, I feel pretty competent					
11	I am satisfied that I can perform well at this task					
12	I think of several ways to solve a problem and choose the best one					
13	I read instructions carefully before I begin a task					
Efforts/Importance						
14	I put lot of efforts into this (peer tutoring) activity					
15	I try very hard to do well at this activity					
16	It is important to me to do well at this activity					
17	I need to put much energy on this activity					
Value/Usefulness						
18	I believe this (peer tutoring) activity can be of some value to me					
19	I think doing this activity is useful for better learning					
20	I think this activity is important to do because it can give high value					
21	I think doing this activity could help me to foster my learning					
22	I believe doing this activity could be beneficial to me					

Appendix B:

Tutors' training guide

Tutors' training guide



Prepared by:

Abid Shahzad (PhD student)

Prof. Dr. Martin Valcke (Promoter)

 **FACULTEIT PSYCHOLOGIE EN
PEDAGOGISCHE WETENSCHAPPEN**

**Department of Educational Studies
Ghent University, Belgium**

Intervention Study-Peer Tutoring Manual

Introduction.

Reciprocal peer tutoring (RPT) as instructional strategy consists of student partnership, linking high achieving students with low achieving students or those with comparable achievements.

The current research focuses on the improvement of student teachers' metacognitive skills with the help of peer tutoring strategies at ITE level in Pakistan. In this study, we will bring peer-tutoring strategy in action in the classroom setting to foster the metacognitive regulations of student teachers. Reciprocal peer tutoring (RPT), metacognitive orientation, planning, monitoring and evaluation, intrinsic motivation and self-efficacy will be specifically focused in this study.

Participating institute

Department of Education, Bahauddin Zakariya University Multan Pakistan.

Participating students

Second year Master of Education (MA) student in morning and evening classes will be the participants.

Focused discipline

Student teachers studying " Teaching of English" as one of the specialized courses will be the focused discipline.

General goal of RPT study

As per a general goal of this study, the impact of RPT on the student teachers' learning performance will be observed, considering the mediating role of co-variables i.e., metacognitive regulation, intrinsic motivation and self-efficacy of students.

Reciprocal peer tutoring strategies in the intervention

Reciprocal peer tutoring (RPT) is of greater importance for the metacognitive gains. Taking the advantage of RPT, we will focus on the use of this strategy to achieve our goal. The RPT procedure enables students to provide facilitating processes for each other: instruction, evaluation, feedback and social support. It is a simple and effective teaching tool that requires little effort on the Instructor's part. In addition, students usually report positive learning experiences with RPT.

The structure of the RPT approach

Content Area	Teaching of English (Master level)
Number of Students	21 student teachers based on 7 groups (3 students in each group)
Role of Student teachers	Tutor & Tutee
Type of interaction	Cooperative, learning in friendly environment
Type of Reward	Social reinforcement, some presents
Level	High mastery level
Outcome	Measured outcomes

Role of Reciprocal Peer Tutoring participants

In our RPT strategy, the roles will be allocated to student teachers as “tutor” and “tutee”. The role will be switched over systematically within the group. Every student teacher will assume the role of “tutor” and “tutee” at due course of time.

Skills to be learnt

Through the peer-tutoring inventory, the students will learn the following skills:

- Eagerness to learn innovatively
- Development of learning-teaching abilities
- Confidence building
- Motivation (Intrinsic and extrinsic)
- Self-efficacy
- Development of social behaviour
- Exchange peer relationships

Main Study

Research Question

What is the impact of the adoption of peer tutoring strategies in teacher training on practices of student teachers?

Variables in the study

In our Reciprocal Peer Tutoring experimental study “Syllabus” is our dependent variable and “Peer tutoring inventory” is our predictor.

Formulation of Hypothesis

H₁- *There is a significant achievement of teacher educators when there is implication of peer tutoring inventory in the syllabus.*

Control and experimental groups

Morning class MA Education student teachers (N=21) will be given treatment (Peer tutoring inventory) and considered as experimental group and MA Education evening class student teachers (N27) will be treated as normal and considered as control group.

Control group	Experimental Group
N=27	N=21

Syllabus (teaching of English)



Method (Normal class teaching)



Examination

Syllabus (teaching of English)



Method (RPT)



Examination

Tutors role card

Following role card will be given to each student teacher, which will remind about his/her responsibilities when acting as a tutor in peer tutoring session.

- I am fully prepared for the lesson
- I am well equipped with the material to be used during RPT process
- I am able give clear direction to the tutees about today's lesson
- I know and I will give frequent reinforcements during the lesson
- I will actively involve the tutees in the lesson
- I will react positively and with patience to the question raised by tutees
- I will keep the tutees on task during the lesson so that main goal is achieved
- I will maintain the level of interest to all tutees during the lesson
- I will be able to complete the lesson within the given time
- I will manage the group in a way that every participant is given opportunity to come up with his/her ideas and contribution to the lesson.

Learning Performance Evaluation

t ₀ →	Exam	Before implementation of peer tutoring inventory
t ₁ →	Exam	Sixth week of inventory
t ₂ →	Exam	twelfth week of inventory

Execution of the plan

Each class 60minutes	Week 1&2 Tue &Wed t ₀ exam	Week 3&4 Tue &Wed	Week 5&6 Tue &Wed t ₁ exam	Week 7&8 Tue &Wed	Week 9& 10 Tue &Wed	Week 11 &12 Tue &Wed t ₂ exam
Control Group N=27 MA Education Second year evening class students	Method Regular Teaching	Method Regular Teaching	Method Regular Teaching	Method Regular Teaching	Method Regular Teaching	Method Regular Teaching
Experimental Group N=21 MA Education Second year morning class students	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa	Method Peer Tutoring <u>Total Groups 7.</u> Number of students in each group=3 One student in each group will act as a tutor and the remaining two students would be tutees and vice versa

Tutor card Session 1

Let the tutees have a brainstorming
Keep an eye on the time

Pre-tutoring activity

- . Provide the group members a solution plan to work out
- . Ask specific questions that suggest a systematic approach
- . Let the group work freely in the solution strategy

During-tutoring activity

- . Monitor the time and the progress of tutees within the group
- . Delegate monitoring time to a tutee

Double check

Whether everyone in the group is actively participating in the activity
Ensure the development of the learning task corresponds to the requested goal
Ensure the insight and understanding of the tutees knowledge by giving feedback and asking questions

Sample questions:

- . What does Teaching of English mean...?
- . Summarizes the characteristics of lines of Teaching of English in Pakistan.
- . Can you give an example of importance and need of Teaching of English?
- . What is the difference between communicative and academic use of TE?
- . Can you elaborate the objectives of Teaching of English in Pakistan?
- . Why do / would you say that English should be the second language in Pakistan?
- . Can you explain why English is becoming the Lingua Franca of Education?
- . What do you know even more about need of Teaching of English for future teachers in their actual classroom teaching?
- . What are the primary and secondary objectives of Teaching of English in Teacher Education Programmes?

Ensure that the end result is an answer to what was asked.

Check whether the goals have been reached.

Check whether there are any questions and ambiguities still remaining?

Give reflection on the cooperation of tutees within the group.

I have responsibilities as a tutor.
--

I can give examples of ways in which I can create a safe learning environment.

I can enumerate characteristics of active listening.

I can give examples of ways in which I can manage interactions between group members.

I know strategies to lift the group discussions at a higher level.

I can give examples of ways in which I can promote knowledge construction in the learning group.

I can boost up a number of characteristics of tutees with good feedback.

I can give examples of various types of questions.

Learning Performance Test

Students' identity _____ Group _____

SECTION ---I (Multiple Choice Questions)

QUESTION NO.01

(15)

NOTE: Encircle only the correct option. Cutting, over-writing and use of ink-remover is not allowed. Each MCQ has (01) Marks:

- Habit formation is developed in:

(a) Behaviorism	(b) Mentalism
(c) Functionalism	(d) Situational approach
- In "Grammar translation Method" the student's role is :

(a) Active	(b) Passive	(c) Just Listener	(d) Moderator
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 In Direct Method, the teacher makes the meaning of new vocabulary clear to the students by :

(a) Translation	(b) Asking questions
(c) Using A.V. aids	(d) comparing & Contrasting
- Behaviorist approach is based on:

(a) Operant Conditioning	(b) Memorization
(c) Cognitive Learning	(d) Writing
- The difference between listening and hearing is of:

(a) Attention	(b) Modification
(c) Mood	(d) Style
- _____ method trained students well in memorization:

(a) Audio-lingual method	(b) Direct method
(c) Grammar translation method	(d) Play-way method
- The ability to "decode" the word is the part of:

(a) Word formation	(b) word transformation
(c) Word recognition	(d) comprehension
- _____ method neglects the psychological order of learning:

(a) Direct method	(b) modern method
(c) Audio lingual method	(d) Grammar translation method
- The main aim of _____ method is to enable the students to develop a direct bond between an English word, phrase or sentence and its meaning:

(a) Direct method	(b) modern method
(c) Audio lingual method	(d) Grammar translation method
- Structures are divided into _____ categories:

(a) Five	(b) Six
(c) Eight	(d) Four
- The structural approach correlates believes:

(a) Grammar & skills	(b) Grammar & composition
(c) Grammar & poetry	(d) Grammar & prose
- In _____ listening, listener tries to understand each and every word:

(a) Extensive listening	(b) Intensive listening
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- (c) Productive listening
 - (d) Practice listening
- To pay systematic attention to functional as well as structural aspect of language is a prominent feature of _____ approach:
 - (a) Structural approach
 - (b) Situational approach
 - (c) Functional approach
 - (d) Natural approach
- The ability to hear the smaller sound parts that language is made up of is called:
 - (a) phonic decoding
 - (b) phonemic awareness
 - (c) Phonological awareness
 - (d) syllable
- Chomsky developed the concept of _____:
 - (a) Structural approach
 - (b) Situational approach
 - (c) Functional approach
 - (d) Functional grammar

SECTION _____ II

(SHORT ANSWER QUESTIONS)

TOTAL MARKS: 15

TIMES ALLOWED: 60 MINS

NOTE: Attempt all items. All items carry equal marks. (3×5=15)

Q No.02): Describe the following:

- Five strategies for developing listening skill.
- Types of structures in English language.
- Five merits of direct method.
- Process of operant conditioning.
- Communicative importance of English language.

(SECTION _____ III)

TOTAL MARKS: 20

TIMES ALLOWED: 20 MINS

NOTE: Attempt all items. All items carry equal marks. (2×10=20)

Q No.03): Describe the process of listening comprehension in detail.

Q No.04): Compare and contrast theories of behaviourism and mentalist.

Summary

Summary

In the current dissertation, we report the findings of three survey studies and one intervention study regarding the perceived adoption of didactical strategies, and related (student) teacher cognitions in a secondary school and an Initial Teacher Education (ITE) setting. In the intervention study, we implemented an evidence-based didactical strategy based on reciprocal peer tutoring (RPT) in the initial teacher education (ITE) context. The need for this intervention study is based on the findings of the three earlier studies that point at the critical status of in-service and pre-service. Weaknesses have been observed that reiterate the well-known theory-practice gap as experienced by graduating and starting teachers (Loughran, 2014). To tackle this gap, we set up an intervention in teacher education that is congruent with more optimal choices for didactical strategies in teaching practice.

Our focus on didactical strategies interconnects with the worldwide adoption of competence-based teacher education frameworks. In the present dissertation a typology – based on Van de Grift (2007) - was used to cluster six types of didactical strategies:

- *Type 1. Strategies that foster the adoption of learning strategies by learners*
- *Type 2. Strategies to match the teaching and learning activities to student characteristics*
- *Type 3. Strategies to make students actively engaged in the classroom*
- *Type 4. Strategies that centre on effective teacher instruction*
- *Type 5. Strategies that help to organize the teaching activities*
- *Type 6. Strategies to develop the positive classroom climate*

The adoption and implementation of didactical strategies is considered as one of the most significant elements in view of preparing teachers for the future (Smith, Douglas & Cox, 2009; Valcke, 2013). Didactical strategies adoption boosts the implementation of teacher competences in teaching and also helps achieving the learning objectives (Hmelo-Silver & Barrows, 2006). The adoption of didactical strategies is also linked to teacher pedagogical beliefs (Ferla, Valcke, & Schuyten, 2008). Studies suggest teacher cognitions play a positive role in the selection and implementation of these didactical strategies (Shahzad, Tondeur,

Zulfqar, & Valcke, 2015). Studies are scarce, focusing on the relationship of didactical strategies with teacher cognitions i.e., pedagogical beliefs, self-efficacy beliefs, intrinsic motivation and metacognitive awareness etc. While we observe – in the in-service and pre-service teachers - a weak and non-varied adoption of evidence-based didactical strategies, this is also the case in teacher educators’ teaching practices (Valcke, 2013). This means that we already observe a theory-practice gap in the ITE setting. To bridge this theory-practice gap, the results of our own empirical studies inspired us to introduce an innovative teacher education didactical strategy in the ITE setting based on reciprocal peer tutoring (RPT). The implementation of this evidence-based didactical strategy was expected to enhance – as a particular teacher cognition - metacognitive regulation (de Backer, van Keer, & Valcke, 2012), next to a positive impact on student teacher learning performance (Dioso-Henson, 2012; Donche & Van Petegem, 2011; Liu & Devitt, 2014).

Above, we briefly summarised the conceptual framework of the studies that were more extensively explained in the first five chapters of the current dissertation. In this summary, we further elaborate the research questions of the current PhD and look at how the results of the students help to answer these research questions.

Research questions

In the introductory chapter (Chapter 1) of this thesis, we introduced the general research question addressed with the dissertation. *What is the current state of the art as to the adoption of didactical strategies in Pakistan? To what extent are teacher cognitions related to the adoption of didactical strategies in Pakistan secondary schools and initial teacher education?*

We addressed this general research question on the base of four studies, reported in Chapter 2 through Chapter 5 of the dissertation. For the purpose of the individual studies, the general research question was specified with the following research questions:

- RQ1. What is the current state of the art as to the (perceived) adoption of didactical strategies by (student) teachers?
- RQ2. How is the (perceived) adoption of didactical strategies by (student) teachers related to teacher cognitions?
- RQ3. What is the current state of the art as to the adoption of didactical strategies by

teacher educators?

- RQ4. Does RPT - as an innovative teacher education strategy - positively influence student teacher learning performance?
- RQ5. To what extent do changes in teacher cognitions interact with the positive impact of RPT on student teacher learning performance?

These research questions were tackled in four studies that are summarised in the next paragraphs. This grounds a general discussion of the findings and the development of a general conclusion to underpin the theoretical contribution of this doctoral dissertation and related implications for secondary schools, initial teacher education, teacher educators, policy makers, and curriculum developers and other stakeholders.

Overview of the studies presented in this dissertation

Study 1. Secondary school teachers' adoption of didactical strategies and its interrelationship with teacher cognitions

The first study, described in Chapter 2, is to determine the current adoption of didactical strategies by secondary school teachers (N=395) and to explore its interrelationship with teacher teaching self-efficacy beliefs and the pedagogical beliefs. This study pursued two research questions related to *perceived behaviour* and *beliefs* of teachers in Pakistan secondary schools. The first research question '*What is the current state of the art as to the (perceived) adoption of didactical strategies by school teachers?*' was linked to existing teaching practices in Pakistan secondary schools. Results of the study suggest secondary school teachers were basically aware of their adoption and implementation of a variety in didactical strategies. But, in fact, their adoption level was low compared to a critical benchmark. Secondary school teachers were implementing – at a rather basic level – the following didactical strategies in their classroom: strategies that foster the adoption of learning strategies by learners, strategies to match the teaching and learning activities to student characteristics, strategies to make students actively engaged in the classroom, strategies that centre on effective teaching, strategies that help to organise the teaching activities and strategies to develop the positive classroom climate. These very basic results

question the professional status of in-service teachers and put forward the challenge of remediating the current weak adoption level of didactical strategies. The second research question “*How is this (perceived) adoption of didactical strategies by teachers related to teacher cognitions?*” focuses on the interrelationship between secondary school teachers’ current adoption of didactical strategies and their teacher cognitions i.e., teaching self-efficacy beliefs and the pedagogical beliefs. The results denote a positive relationship of teacher cognitions with the adoption of didactical strategies. More in particular, the results show how higher levels in decision-making self-efficacy, instructional self-efficacy and disciplinary self-efficacy beliefs are positively linked with the self-reported adoption/implementation of didactical strategies. Also, we found how higher levels in both traditional and constructivist pedagogical beliefs were linked with the reported higher adoption/implementation of a larger variety of didactical strategies. Building on the available literature, we could not find a single study in Pakistan’s secondary school teachers’ context that explored – thus far - this relationship. In fact, in the context of pre-service or in-service teachers’ training, teacher cognitions are hardly given due consideration (Clarke & Hollingsworth, 2002).

Study 2. Student teachers’ perceived adoption of didactical strategies and its interrelationship with cognitions

The second study, described in Chapter 3, deals with the perceived adoption of didactical strategies of student teachers (N=250) and explores – again - how this is related with student teacher cognitions i.e., their pedagogical beliefs, and teaching self-efficacy beliefs. This study was based on two research questions related to (intended) *behaviour* and *beliefs* of student teachers enrolled in an initial teacher education (ITE) programme. The first research question “*What is the current state of the art as to (perceived) adoption of didactical strategies by student teachers?*”, is linked to current teaching practices in the initial teacher education institutions. Results of the study suggest that there was an overall weak perceived adoption of a variety of didactical strategies by student teachers. This is critical in view of future teaching practices in schools. Literature suggest that in view of a successful preparation of future teachers, the perceived adoption of student teachers’ didactical strategies e.g., learning activity, delivering the course-content, classroom management and the students’ involvement in the course etc, must be reasonably high

(Eilam & Poyas, 2009; Manuel & Hughes, 2006; Tondeur et al., 2012).

To answer the second research question *“How is the perceived adoption of didactical strategies by student teachers related to student teacher cognitions?”*, the present study explored this relationship on the base of survey data. The results indicate there were a significant relationship between student teacher cognitions and the perceived adoption of didactical strategies. The results from the respondents (N=250) indicate that higher levels of decision-making self-efficacy; instructional self-efficacy and disciplinary self-efficacy beliefs were positively linked with the adoption of varying types of didactical strategies. Similarly, traditional and constructivist pedagogical beliefs were positively linked with the perceived adoption of didactical strategies by the student teachers.

The importance of cognitions has been overlooked in the initial teacher education in Pakistan and elsewhere, as we could hardly find any study that focus on the student teacher cognitions. Korthagen and Kessels (1999) already referred to this problem while pleading for a more realistic teacher education approach.

Study 3. Teacher educators’ and student teachers’ adoption of didactical strategies

The third study, presented in Chapter 4, deals with the current state of the art as to the adoption of didactical strategies by student teachers and teacher educators. This study reiterated the first and third research questions *“What is the current state of the art as to the (perceived) adoption of didactical strategies by student teachers?”* and *“What is the current state of the art as to the (perceived) adoption of didactical strategies by teacher educators?”* The latter research question is related to perceived/reported *behaviour* of teacher educators. Results of the study indicate a basic adoption level of a variety in didactical strategies by teacher educators. Although both teacher educators and student teachers were basically aware of the implementation of these strategies, both reflected a low adoption level. This is in conflict with the literature pushing a high adoption level of varying didactical strategies, next to a thorough understanding of the subject matter to establish successful teacher preparation (Rots, Aelterman, Vlerick, & Vermeulen, 2007; Tulbure, 2011, 2012).

Our finding can be explained by a lack of effective transmission-involvement-engagement approaches related to didactical strategies, knowledge, and skills by teacher educators in

the ITE programmes. Results suggest this (knowledge/skills transfer) gap between teacher educators and the student teachers minimises the potential adoption and implementation of a wide variety of didactical strategies. An adequate ITE approach demands that teacher educators' adoption of didactical strategies, selection and implementation of teaching material and lesson planning must match the students' ability (Valcke et al., 2010).

Study 4. The differential effect of reciprocal peer tutoring (RPT) on student teachers' learning performance

The fourth study, described in Chapter 5, deals with the differential impact of adopting reciprocal peer tutoring (RPT) in an ITE setting, on student teachers' learning performance and the mediating effects of the co-variables i.e., intrinsic motivation, metacognitive awareness and self-efficacy beliefs. This RPT intervention study was based on two research questions related to the *beliefs* (student cognitions) and actual *behaviour* of student teachers in their initial teacher education (ITE) settings. We put forward two hypotheses for this study:

3. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition.
4. Students in the RPT condition will attain a significantly higher learning performance scores as compared to students in the control condition, considering the mediating impact of attaining a higher level in intrinsic motivation, an increase in metacognitive awareness and an increase in self-efficacy beliefs.

The pre-test post-test quasi-experimental study was set up in the context of an authentic initial teacher education programme and within the setting of the subject "Teaching of English", involving final years Masters in Education (MA) student teachers ($N=48$). In an experimental condition, students studied the topics while adopting a reciprocal peer tutoring didactical approach. The results indicate a positive impact of RPT on student teachers' learning performance. The findings of this study - particularly in the Pakistan context - but also beyond - are significant in view of the "congruency discussion" of ITE approaches. Further, it provides stepping-stones for curriculum developers, policy makers, teacher education designers, and other stakeholders involved in ITE. For the Pakistan ITE context, the study is a milestone, considering the scarce literature studying the contextual

nature of adequate teaching and learning approaches.

As to the second research hypothesis, no evidence was found underpinning the potential mediating effect of intrinsic motivation, self-efficacy, and metacognitive awareness.

The available literature did already underpin the significant and notable contribution of collaborative learning strategies - such as RPT - on students' learning performance in educational settings (Barkley, Cross, & Major, 2014; de Backer, van Keer, & Valcke, 2012; de Smet, van Keer, & Valcke, 2008; Topping, 1995). As researchers report, peer tutoring has a history of over four decades and consistently reports positive outcomes (Bowman-Perrott et al., 2013). RPT has yet but recently been introduced as a didactical approach in ITE settings (see, e.g., Eriksson & Player-Koro, 2015; Li & Peters, 2016). Again, it proves to be a promising alley.

After completion of the RPT intervention, we also collected written answers to open ended questions from five RPT students involved in focus groups. The qualitative results reiterated in a similar way the positive findings of the quantitative study. They reported an important impact from the RPT experience. As to the impact on their student cognitions, they reported these were already far developed prior to the intervention and as such did not feel these were boosted by the RPT experience.

General discussion

Based on our typology of didactical strategies, we studied the current level in the adoption of types of strategies in (1) secondary school teachers (2) student teachers and (3) teacher educators in Pakistan. As such, these studies contribute to the literature when looking for related studies set up in challenging developing countries contexts.

Our research findings about the low-level adoption of didactical approaches in Pakistan's ITE context provoked the exploration of the issue whether the didactical strategies have any relationship with the (student) teachers' cognitions (teaching self-efficacy beliefs and pedagogical beliefs). This led to an additional research question in studies 1 and 2, while administering additional survey instruments based on (student) teacher cognitions (teaching self-efficacy beliefs and pedagogical beliefs).

The results of studies 1 and 2 point at a positive interrelationship between the adoptions of varying types of didactical strategies and the (student) teacher pedagogical and self-efficacy beliefs. The results of the first study (Chapter 2) indicate that constructive and traditional pedagogical beliefs were positively linked with the six types of didactical strategies. As stated already above, it is remarkable that higher levels in both constructivist and traditional beliefs boosted the adoption of the six types of didactical strategies. This finding was already stated in ICT related research where the integrated use of information and communication technologies was also strongest in teachers with high levels in both types of pedagogical beliefs (Sang, Valcke, Braak, & Tondeur, 2010). Though it sounds initially strange that also “traditional” pedagogical beliefs have a positive impact, this can be explained. Teachers with well developed traditional and constructivist beliefs can be considered as stronger professionals, who are flexible in their selection of didactical strategies. They consider a variety of options before making decisions when pursuing the educational objectives while considering their belief systems. Authors tend to stress the dichotomy between the pedagogical beliefs. This can result in bias and undervaluing the importance of balancing pedagogical beliefs in the complex teaching and learning setting. In technology rich contexts, authors tend to strive for the adoption of learner-centred constructivist pedagogical beliefs and point at mismatches between beliefs and e.g., technology adoption (see, e.g., Liu, 2011). In their study about teacher beliefs and mathematics learning, Staub and Stern, (2002) favour constructivist pedagogical beliefs and could show how a higher adoption level of these beliefs was related to higher achievement in word problems. But this was not found when the learning objectives were related to the acquisition of factual knowledge and computational proficiency. The former does not imply that teachers should stick to one particular dimension in their pedagogical beliefs. It suggests teachers should be sensitive to the nature of the educational objectives at hand. The seminal paper of Richardson about beliefs and teachers gave - already in 1996 - a clear overview of how inflexibility in belief systems of teachers hinder their actions, choices, approaches towards the subject content, attention to be paid to learner differences, the nature of their pedagogical content knowledge, etc. In their study of physics education, Belo, van Driel, van Veen, and Verloop (2014) referred to literature that found how “the majority of teachers “wobbled” in their beliefs about teaching and learning: they possessed both ‘teacher-centred’ and ‘student-centred’ beliefs” (ibid, p. 90). In their study they could

show how teachers agreed with both teacher- and student-regulated learning and how teachers were flexible in their position considering the nature of the learning objectives. As such, they found that e.g., transmission / qualification-oriented beliefs were more strongly related to an emphasis on the acquisition of fundamental physics learning objectives. Their results are consistent with the findings of Mansour (2013) who also found this “wobbling” approach, but especially stressed the consistencies between whatever adoption of a belief position and related instructional practices: “Some of the teachers’ beliefs were consistent with their practices, especially the traditional beliefs, while some of teachers’ practices were conflicted with their beliefs in different contexts” (ibid, p.1230). The same was found in the context of language learning research (see, e.g., Zhang & Liu, 2014). But it has to be stressed that comparing research can be marred by differences in cultural settings in which the studies have been set up. Nevertheless, the research is not univocal as to the relationship between the nature of the beliefs and the related instructional actions. For instance, Chai, Koh, and Tsai (2013, p.659) found: “evidence that constructivist-oriented teachers do support the traditional use of ICT”. We repeat that flexibility seems to be the optimal condition in teacher’s adoption of belief systems.

In the discussion, we further focus on the theory-practice gap in education. Building on our findings in the first three studies, we reiterate a worldwide discussion about the nature and quality of teacher education. This brings us to a more –in-depth discussion of the critical nature of more promising ITE programs. In this context we build on Korthagen, Loughran, and Russell (2006) who address the issue of coherence between teacher educators and ITE programmes. They present seven principles to be acknowledged and fully responded by teacher educators in teacher education programmes. In our study, reported in chapter 4, teacher educators’ low level of adoption questions the ability of teacher educators to respond to these seven principles. But, a topic stressed to a lesser extent in this PhD, is the focus on teacher educators’ beliefs when adopting particular didactical strategies. The seven principles of Korthagen, Loughran, and Russell (2006) clearly suggest how we might have to make teacher educators’ beliefs explicit to foster their development. The results of our intervention study (Chapter 5) exemplify how a shift in ITE approaches might be beneficial for students. The direct impact of RPT strategy on student teacher learning performance strengthens the potential of adopting evidence-based didactical

Summary

approaches in ITE settings. The results also suggest RPT helped developing self-management, cooperation, autonomy, self-discipline and self-confidence in students. Results – building on the small number of open ended answers - indicate that in some groups student teacher behaviour was autocratic and not friendly, calling for more intensive training of tutors that is beneficial in enhancing teaching competences.

In the discussion, continuously repeated how the (intended) adoption of didactical strategies was below a benchmark. This introduces a discussion about what minimum mastery or adoption level can be expected from teachers in general and teacher educators in particular. When discussing the results, it was hard to find straightforward benchmarks in the literature to judge the “level” of adoption. This is a recurrent problem in the research and practice-related literature. With the exception of discussions about technology related competences, it is very difficult to find studies that present explicit minimal levels (see e.g., Kirschner & Davis, 2003; Northrup & Little, 1996).

The results - presented in the current dissertation – can also be linked to literature calling for strengthening teacher education in view of the 21st century skills; such as: enhancement of teacher competences, teacher willingness to teach, teacher teaching skills and bridging the theory-practice gap in ITE (Darling-Hammond, 2006; Day, 1999; Korthagen, 2005; Valcke, 2013; Zeichner, 2013). When discussing “what is lacking in the current teacher practices?” Hattie (2009, p.109-110) especially points at the lack of adoption of evidence-based strategies in teacher education that goes together with the narrow band within strategies being adopted and the lack of adoption of these strategies by the teacher educators themselves.

In the pre-final section of the PhD, we elaborate the theoretical, methodological, practical and policy contributions of the dissertation.

In the limitations section of the section, we point at eight shortcomings that should be tackled in future research. Some limitations are rather methodological in nature (e.g., nature of research instruments, specificity of the research setting, sample sizes, ...); other limitations point at the need for a multi-actor perspective, the need for established standards to judge the adoption of didactical strategies, the fact didactical strategies were studied in isolation form other teacher cognitions. A more holistic approach should be adopted.

The final section of the dissertation elaborates an innovative project to be set up in the Pakistan context that builds on the insights developed in this PhD. This project aims at establishing a center that focuses on teacher education and future teachers in secondary schools. In particular it aims at starting sustainable chain reaction to improve the nature of teacher education and the future quality of teachers in secondary schools.

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**Nederlandstalige
Samenvatting
(Summary in Dutch)**

Samenvatting

In het huidige proefschrift rapporteren we de resultaten van drie survey studies en één interventiestudie met betrekking tot de adoptie van didactische strategieën, en de daarmee samenhangende (student) leerkracht cognities in het secundair onderwijs en een Initiële Leerkrachten Opleiding (ILO). In de interventiestudie werd een evidence-based didactische strategie geïmplementeerd gebaseerd op peer tutoring (Reciprocal Peer Tutoring RPT) in de initiële leerkrachtenopleiding (ILO) context. De keuze voor deze interventie studie is gebaseerd op de resultaten van de drie eerste studies die wijzen op de kritische kwaliteit van inservice en pre-service leerkrachten. Zwakke punten wijzen op de gekende theorie-praktijk kloof zoals ervaren door studentleerkrachten en recent afgestudeerde leerkrachten (Loughran, 2014). Om deze kloof te pakken, wordt de interventie in de leerkrachtenopleiding gebaseerd op een didactische aanpak die congruent is met evidence-based keuzes voor didactische strategieën in de onderwijspraktijk.

De focus op didactische strategieën in het proefschrift kan gekoppeld worden aan de aandacht voor competentiegerichte leerkrachtenopleiding. In dit proefschrift wordt een typologie - op basis van Van de Grift (2007) - gebruikt om zes clusters aan didactische strategieën te onderscheiden:

- Type 1. Strategieën die het oppikken van leerstrategieën door leerlingen bevorderen;
- Type 2. Strategieën die de onderwijs-en leeractiviteiten afstemmen op leerlingkenmerken;
- Type 3. Strategieën om studenten te activeren in de klas;
- Type 4. Strategieën die zich richten op effectieve instructiestrategieën;
- Type 5. Strategieën die vooral de organisatie van het onderwijs benadrukken;
- Type 6. Strategieën om een positief klasklimaat te bevorderen.

Het kiezen en implementeren van didactische strategieën wordt beschouwd als een van de belangrijkste factoren bij een goede voorbereiding van leerkrachten voor de toekomst (Smith, Douglas & Cox, 2009; Valcke, 2013). Didactische strategieën versterken het realiseren van leerkrachtcompetenties in het onderwijs en helpen ook om optimaler de leerdoelen te bereiken (Hmelo-Silver & Barrows, 2006). De adoptie van didactische

strategieën is gekoppeld aan leerkrachtbeliefs (Ferla, Valcke, & Schuyten, 2008). Onderzoek toont aan hoe dergelijke leerkrachtcognities positief inspelen op de en implementatie van didactische strategieën (Shahzad, Tondeur, Zulfqar & Valcke, 2015). Onderzoek is schaars dat focust op de relatie tussen het oppikken van didactische strategieën en leerkrachtcognities; meer in het bijzonder de cognities onderzocht in dit proefschrift: pedagogische overtuigingen, zelfeffectiviteitsoordelen, intrinsieke motivatie en metacognitieve awareness. Zowel bij inservice als pre-service leerkrachten stellen we een zwakke adoptie en implementatie vast van evidence-based didactische strategieën. Dit blijkt ook het geval bij de leerkrachtenopleiders (Valcke, 2013). Dit betekent dat we de theorie-praktijk kloof ook observeren in ILO contexten. Om deze theorie-praktijk kloof te overbruggen, werden op basis van het voorliggende onderzoek in het(proefschrift beslist om een innovatieve didactische strategie in te voeren in een leerkrachtenopleiding; meer bepaald een strategie gebaseerd op peer tutoring (RPT). Op basis van theorie en onderzoek verwachten we dat deze – congruente – didactische aanpak enerzijds een positieve invloed zal hebben op de leerkrachtcognities – in dit geval metacognitieve regulatie (de Backer, Van Keer, & Valcke, 2012) - naast een positieve invloed op de leerprestaties van de student leerkrachten (Dioso-Henson, 2012; Donche & van Petegem, 2011; Liu & Devitt, 2014).

De bovenstaande samenvatting van het conceptuele en theoretische kader wordt meer in detail uitgewerkt in de eerste vijf hoofdstukken van het huidige proefschrift. In deze samenvatting gaan we verder in op de onderzoeksvragen en bekijken we hoe de analyseresultaten helpen deze onderzoeksvragen te beantwoorden. Vervolgens vatten we onze discussie samen.

Onderzoeksvragen

In het inleidende hoofdstuk (hoofdstuk 1) van dit proefschrift, introduceerden we de algemene onderzoeksvragen van dit proefschrift. Wat is de huidige stand van zaken wat betreft de adoptie en implementatie van didactische strategieën in Pakistan? In hoeverre zijn leerkrachtcognities gerelateerd aan de adoptie en implementatie van didactische strategieën in het Pakistaanse secundaire onderwijs en de initiële leerkrachtenopleiding?

Deze algemene onderzoeksvraag wordt in vier studies aangepakt, zoals beschreven in hoofdstuk 2 tot en met hoofdstuk 5. Met het oog op de meer gerichte deelstudies, werd de algemene onderzoeksvraag aangepakt via de volgende deelvragen:

- RQ1. Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van didactische strategieën door (student) leerkrachten?
- RQ2. Hoe is de (gepercipieerde) adoptie en implementatie van didactische strategieën door (student) leerkrachten gerelateerd aan hun leerkrachtcognities?
- RQ3. Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van didactische strategieën door leerkrachtenopleiders?
- RQ4. Heeft RPT als een innovatieve leerkrachtenopleiding strategie, een positieve impact op de leerprestaties van studentleerkrachten?
- RQ5. In hoeverre is er bij het effect van RPT of de leerprestaties van studentleerkrachten een interactie door veranderingen in hun leerkrachtcognities?

Deze onderzoeksvragen werden aangepakt in vier studies die zijn samengevat in de volgende paragrafen. Dit vormt de basis voor een algemene bespreking van deze bevindingen en de uitwerking van een algemene conclusie wat betreft de theoretische bijdrage van dit proefschrift en de implicaties voor het secundair onderwijs, de initiële leerkrachtenopleiding, leerkrachtenopleiders, beleidsmakers, en curriculum ontwikkelaars.

Overzicht van de studies in het proefschrift

Studie 1. De adoptie en implementatie van didactische strategieën door leerkrachten secundair onderwijs en de interactie met hun leerkrachtcognities

De eerste studie, beschreven in Hoofdstuk 2, helpt de gerapporteerde adoptie en implementatie van didactische strategieën te bepalen door leerkrachten secundair onderwijs (N = 395) en de interactie met de volgende leerkrachtcognities: zelfeffectiviteitsoordelen (self efficacy) en onderwijsopvattingen (pedagogical beliefs). Met de studie worden twee onderzoeksvragen onderzocht over het gerapporteerde instructiegedrag en de cognities van leerkrachten in Pakistaanse secundaire scholen. De eerste onderzoeksvraag: "Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van didactische strategieën door leerkrachten?" werd onderzocht door

inservice leerkrachten te bevragen. De resultaten van de studie suggereren dat deze leerkrachten zich matig bewust zijn van hun adoptie en implementatie van didactische strategieën. Maar, deze adoptie en implementatie van didactische strategieën is laag in vergelijking met een kritische benchmark. De betrokken leerkrachten rapporteren op een basaal niveau dat ze de volgende strategieën toepassen: strategieën die de adoptie van leerstrategieën bevorderen door leerlingen, strategieën om de onderwijs- en leeractiviteiten af te stemmen op de leerlingkenmerken, strategieën om studenten actief te betrekken bij de instructie, strategieën die focussen op effectief onderwijs, strategieën gericht op de organisatie van het onderwijs en strategieën om een positief klasklimaat te ontwikkelen. De zeer basale adoptie en implementatie is een uitdaging voor de professionalisering van deze leerkrachten. De tweede onderzoeksvraag "Hoe is de (gepercipieerde) adoptie en implementatie van didactische strategieën door leerkrachten gerelateerd aan hun leerkrachtcognities?" kijkt naar de mate waarin de adoptie/implementatie van de didactische strategieën samenhangt met leerkrachtcognities. De resultaten duiden op een positieve relatie tussen leerkrachtcognities en de adoptie/implementatie van de didactische. Meer in het bijzonder zien we hoe hogere niveaus in self-efficacy m.b.t. besluitvorming (decision making), educatieve self-efficacy en disciplinaire zelfeffectiviteitsoordelen samenhangen met een hogere mate van zelf-gerapporteerde adoptie / implementatie van didactische strategieën. Ook vonden we hoe een hoger niveau in zowel traditionele als constructivistische pedagogische opvattingen gerelateerd is aan een hogere gerapporteerde adoptie / implementatie van een grotere variëteit aan didactische strategieën. Tot nu toe werd de relatie tussen leerkrachtcognities en didactische strategieën nauwelijks onderzocht in de literatuur; zeker niet in Pakistan. Dit sluit aan bij het pleidooi dat, in het kader van de pre-service of bijscholing van leerkrachten, leerkrachtcognities meer aandacht moeten krijgen (Clarke & Hollingsworth, 2002).

Studie 2. De adoptie en implementatie van didactische strategieën door studentleerkrachten en de interactie met hun leerkrachtcognities

De tweede studie, beschreven in hoofdstuk 3, handelt over de gerapporteerde adoptie / implementatie van didactische door studentleerkrachten (N = 250) en verkent - opnieuw - hoe dit is gerelateerd aan studentleerkrachtcognities; meer bepaald hun pedagogische opvattingen en zelfeffectiviteitsoordelen. Deze studie was gebaseerd op twee

onderzoeksvragen in verband met (gepercipieerde) instructiegedrag en opvattingen van leerkrachten in een initiële leerkrachtenopleiding (ILO).

De eerste onderzoeksvraag: "Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van didactische strategieën door studentleerkrachten?", is gekoppeld aan de kwaliteit van het onderwijs in de initiële leerkrachtenopleidingen. De resultaten van het onderzoek suggereren dat er slechts een zwakke adoptie/implementatie wordt gerapporteerd van didactische strategieën door de studentleerkrachten. Dit is een kritische bevinding met het oog op de toekomst in de onderwijspraktijk. De literatuur benadrukt dat met het oog op een succesvolle voorbereiding van toekomstige leerkrachten, de adoptie van 'didactische strategieën bv, leeractiviteit, het leveren van de cursus-inhoud, klasmanagement en de studentbetrokkenheid bij de opleiding enz. hoog moet zijn (Eilam & Poyas, 2009; Manuel & Hughes, 2006; Tondeur et al, 2012).

Om de tweede onderzoeksvraag te beantwoorden: "Hoe is de (gepercipieerde) adoptie en implementatie van didactische strategieën door studentleerkrachten gerelateerd aan hun leerkrachtcognities?" bevestigt opnieuw hoe er een significante relatie bestaat tussen leerkrachtcognities en de adoptie en implementatie van didactische strategieën. Hogere niveaus in decision-making self-efficacy; educatieve self-efficacy en disciplinaire self-efficacy blijken samen te hangen met een hogere adoptie/implementatie van didactische strategieën. Ook een hogere mate van het aanhangen van traditionele en constructivistische pedagogische opvattingen blijkt positief samen te hangen met die didactische strategieën. Het belang van leerkrachtcognities wordt dikwijls over het hoofd gezien in initiële leerkrachtenopleidingen; in Pakistan en elders. In de literatuur is er nauwelijks gerelateerde studies terug te vinden. Korthagen en Kessels (1999) wezen reeds eerder op dit probleem, wanneer ze pleitten voor een meer realistische benadering van de leerkrachtenopleiding.

Studie 3. Leerkrachtenopleiders en studentleerkrachten: didactische strategieën en leerkrachtcognities

De derde studie, besproken in hoofdstuk 4, gaat in op dezelfde problematiek als de vorige hoofdstukken, maar verlegt de focus naar studentleerkrachten en leerkrachtenopleiders. Hierdoor verschuiven de onderzoeksvragen naar de eerste en de derde onderzoeksvraag: "Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van

didactische strategieën door studentleerkrachten? en “Wat is de stand van zaken wat betreft de (gepercipieerde) adoptie en implementatie van didactische strategieën door leerkrachtenopleiders?” Deze laatste onderzoeksvraag is gerelateerd aan het gerapporteerde instructiegedrag van leerkrachtenopleiders. De resultaten van de studie wijzen op een basaal niveau in de mate van adoptie/implementatie van werkvormen door leerkrachtenopleiders. Hoewel zowel de leerkrachtenopleiders als de studentleerkrachten zich bewust zijn van deze strategieën, valt toch het zeer lage adoptieniveau op; significant lager dan een vooropgestelde benchmark van 80%. Dit staat in scherp contrast met de literatuur die benadrukt dat een hoge mate van adoptie van didactische strategieën, naast een grondige kennis van het onderwerp garant staat voor een succesvolle voorbereiding als leerkracht (Rots, Aelterman, Vlerick, & Vermeulen, 2007; Tulbure, 2011, 2012).

Onze resultaten suggereren een gebrek aan effectieve transmissie-betrokkenheid met betrekking tot didactische strategieën en gerelateerde kennis en vaardigheden van leerkrachtenopleiders in de ILO's. De resultaten suggereren dat er nog steeds een theorie-praktijk kloof bestaat. Een adequate ILO aanpak vereist dat leerkrachtenopleiders “zelf sterker verder bouwen op een rijke variatie aan didactische strategieën, op een bewuste selectie en implementatie van lesmateriaal en het kiezen van een lesplan die aansluit bij de studenten (Valcke et al., 2010).

Studie 4. De differentiële impact van reciprocal peer tutoring op de leerprestaties en studentcognities van studentleerkrachten

De vierde studie, beschreven in Hoofdstuk 5, behandelt de impact van reciprocal peer tutoring (RPT) in een ILO setting. Een differentieel effect wordt onderzocht op de leerprestaties van de studentleerkrachten en de mogelijke interactie door veranderingen in intrinsieke motivatie, metacognitief bewustzijn (metacognitive awareness) en zelfeffectiviteitsoordelen (self-efficacy). De RPT interventiestudie was gebaseerd op twee onderzoeksvragen die verband houden met de opvattingen (student cognities) en de feitelijke gedrag van studentleerkrachten in hun initiële leerkrachtenopleiding (ILO). We voeren twee hypothesen voor deze studie:

1. Studentleerkrachten in een RPT conditie zullen significant hogere leerprestaties neerzetten in vergelijking met studentleerkrachten in een controle conditie.

2. Studentleerkrachten in een RPT conditie zullen significant hogere leerprestaties scores bereiken in vergelijking met leerlingen in de controle conditie, rekening houdend met het mediërend effect van een hoger niveau aan intrinsieke motivatie, een toename van metacognitieve bewustzijn en een toename in de zelfeffectiviteitsoordelen .

De pre-test post-test quasi-experimentele studie werd opgezet in het kader van een authentieke initiële leerkrachtenopleiding; meer bepaald in de setting van de cursus "Teaching of English". Voor dit laatste mastervak waren 48 studentleerkrachten betrokken in het onderzoek. In de experimentele conditie, bestudeerden studenten de onderwerpen via een reciprocal peer tutoring aanpak. De resultaten wijzen op een positieve impact van RPT op de leerprestaties. Deze resultaten zijn – zeker voor de Pakistaanse context - maar ook daarbuiten – sterk vernieuwend in het licht van de "congruentie discussie 'van ILO's. Verder bieden de resultaten bouwstenen voor curriculumontwikkelaars, beleidsmakers, ontwerpers van leerkrachtenopleidingen en andere stakeholders betrokken bij de ILO. Voor de Pakistaanse ILO context is de studie is een mijlpaal, gezien de schaarse literatuur over de effecten van alternatieve instructieaanpakken in het onderwijs in het algemeen en ILO's in hetbijzonder.

Met betrekking tot de tweede onderzoeksvraag, werden geen indicaties gevonden die wijzen op een mediërend effect/interactie-effect van intrinsieke motivatie, self-efficacy, en metacognitief bewustzijn.

De beschikbare literatuur bevat reeds heel wat steun voor de bijdrage van samenwerkend leren - zoals de RPT - op leerprestaties (Barkley, Cross, & Major, 2014; de Backer, Van Keer, & Valcke, 2012; de Smet, van Keer, & Valcke, 2008; Topping, 1995). Onderzoekers rapporteren systematisch hoe peer tutoring gedurende de laatste vier decennia consequent tot positieve resultaten leidt (Bowman-Perrott et al., 2013). RPT is pas recent geïntroduceerd als een didactische aanpak in ILO-instellingen (zie bijv Eriksson & Player-Koro, 2015; Li & Peters, 2016). Ook hier – op basis van voorliggend onderzoek - het opnieuw een veelbelovende aanpak

Na de RPT-interventie, werden vijf studenten uit de experimentele conditie betrokken in een focusgroep. De kwalitatieve analyseresultaten van antwoorden op open vragen hernemen de positieve resultaten van de kwantitatieve studie. Zij tonen de belangrijke invloed van de RPT-ervaring op studenten. Ten aanzien van de impact op hun

studentcognities, geven studenten aan dat deze reeds ver ontwikkeld waren voor het feitelijke onderzoek; zodat de impact zodanig niet werd versterkt door de RPT-ervaring.

Algemene discussie

Op basis van een typologie van didactische strategieën bestudeerden we de adoptie en implementatie van didactische strategieën bij (1) leerkrachten secundair onderwijs, (2) studentleerkrachten en (3) leerkrachtenopleiders in Pakistan. Als zodanig dragen deze studies bij tot de literatuur over gelijkaardige onderzoeksvragen in ontwikkelingslanden.

Onze onderzoeksresultaten benadrukken – consistent – een matige mate van adoptie/implementatie van didactische strategieën door (student)leerkrachten. Dit leidde tot onderzoeksvragen - in studies 1 en 2 – of dit samenhangt met leerkrachtcognities (onderwijs zelfeffectiviteitsoordelen en pedagogische opvattingen). De resultaten van studies 1 en 2 wijzen op een positieve wisselwerking tussen verschillende didactische strategieën en de (student) leerkracht pedagogische en zelfeffectiviteitsoordelen. De resultaten van de eerste studie (hoofdstuk 2) geven aan dat zowel constructivistische en traditionele pedagogische opvattingen positief zijn gekoppeld aan de zes soorten didactische strategieën. Het is opmerkelijk dat wel hogere niveaus in constructivistische als traditionele overtuigingen een impuls geven aan de adoptie/implementatie van didactische strategieën. Deze bevinding werd reeds gerapporteerd in ICT-gerelateerd onderzoek, waar het geïntegreerd gebruik van informatie- en communicatietechnologieën ook het sterkst was in leerkrachten die hoge niveaus rapporteerden in beide typen pedagogische opvattingen (Sang, Valcke, Braak, & Tondeur, 2010). Hoewel het in eerste instantie vreemd is dat ook de "traditionele" pedagogische opvattingen positief samenhangen met de adoptie/implementatie van didactische strategieën, kan dit worden verklaard. Leerkrachten met goed ontwikkelde traditionele en constructivistische opvattingen kunnen gezien worden als een sterkere professionals, die flexibel zijn in hun keuze van didactische strategieën. Zij houden een bredere waaier aan opties open bij het maken van beslissingen over het nastreven van de onderwijsdoelstellingen. In de literatuur hebben auteurs de neiging om de verschillen tussen de pedagogische opvattingen te benadrukken. Dit kan leiden tot bias en een onderwaardering van het belang om verschillende pedagogische opvattingen mee te nemen in onderwijsoverwegingen. In technologierijke contexten,

hebben auteurs de neiging om constructivistische pedagogische opvattingen te benadrukken en zien ze snel een mismatch tussen beliefs en de adoptie van technologie (zie bijvoorbeeld, Liu, 2011). In hun studie over leerkracht overtuigingen en wiskunde leren stelden Staub en Stern (2002) vast dat constructivistische pedagogische opvattingen samenhangen met hogere leerprestatie bij het aanpakken van wiskunde vraagstukken (word problems). Maar dit werd niet gevonden toen de leerdoelen eerder gekoppeld waren aan het verwerven van feitenkennis en klassieke rekenvaardigheden. Dit laatste betekent dat leerkrachten best niet vasthouden aan één bepaalde dimensie in hun pedagogische opvattingen. Het suggereert dat leerkrachten best gevoelig zijn voor de aard van de leerdoelen die centraal staan. De invloedrijke paper van Richardson over "beliefs en leerkrachten" gaf - reeds in 1996 - een duidelijk beeld van hoe een inflexibiliteit in leerkrachtbeliefs belemmerend kan werken op hun acties, keuzes, de vakinhoud, aandacht voor leerlingenverschillen, de keuze van hun vakdidactische kennis, enz. In een vergelijkbare studie over natuurkunde-onderwijs, gaven Belo, van Driel, van Veen, en Verloop (2014) aan dat "de meerderheid van de leerkrachten" eerder "wankelende" opvattingen aanhangen over onderwijzen en leren. In hun onderzoek benadrukten leerkrachten zowel 'leerkrachtgestuurde als 'leerlinggerichte' overtuigingen "(ibid, blz. 90). In hun studie konden ze aantonen hoe leerkrachten die zowel leerkracht- als leerling-gestuurde opvattingen benadrukten, veel flexibeler inspeelden op de aard van de leerdoelen. Als zodanig vonden ze dat bijvoorbeeld transmissie / kwalificatiegerichte overtuigingen sterker doorwerkten wanneer de nadruk lag op het verwerven van funderende leerdoelstellingen natuurkunde. Hun resultaten zijn in overeenstemming met de bevindingen van Mansour (2013) die ook deze "wankelende" aanpak terugvond, maar vooral de nadruk legde op het nastreven van consistentie tussen de eigen opvattingen en de passende educatieve keuzes: "Some of the teachers' beliefs were consistent with their practices, especially the traditional beliefs, while some of teachers' practices were conflicted with their beliefs in different contexts" (ibid, p.1230). Hetzelfde werd gevonden in het kader van onderzoek naar het leren van talen (zie bijvoorbeeld, Zhang en Liu, 2014). Maar het moet worden benadrukt dat het vergelijken van dergelijk onderzoek beïnvloed kan zijn door verschillen in cultuur en de context waarin de studies zijn opgezet. Daarom is het niet verrassend dat niet alle onderzoek eenduidig is over de relatie tussen leerkracht opvattingen en aansluitende keuzes en beslissingen m.b.t. onderwijs.

Bijvoorbeeld, Chai, Koh, en Tsai (2013, p.659) vonden: "evidence that constructivist-oriented teachers do support the traditional use of ICT". We herhalen dat kiezen voor flexibiliteit de meest optimale keuze is wanneer het gaat over leerkrachtcognities. In de discussie, focussen we verder op de theorie-praktijk kloof in het onderwijs. Voortbouwend op de resultaten van de eerste drie studies, herhalen we een wereldwijde discussie over de aard en de kwaliteit van leerkrachtenopleidingen. Dit brengt ons tot een meer diepgaande discussie over de opzet van meer adequate ILO's. In dit verband bouwen we verder op Korthagen, Loughran en Russell (2006) die zeven principes presenteren die garant staan voor meer adequate leerkrachtenopleidingen. De resultaten van de derde studie, beschreven in hoofdstuk 4, kunnen we koppelen aan de mate waarin deze opleiders voldoen aan deze zeven principes. Daarbij is er ook aandacht voor de opvattingen van de opleiders zelf. Toch benadrukken we, in dit doctoraat, in mindere mate de overtuigingen van de leerkrachtenopleiders zelf. De zeven principes van Korthagen, Loughran en Russell (2006) geven duidelijk aan how we might have to make teacher educators' beliefs explicit to foster their development".

De resultaten van de interventiestudie (hoofdstuk 5) illustreren hoe een verschuiving in ILO benaderingen gunstig kan zijn voor studentleerkrachten. De directe impact van de RPT-strategie op de prestaties van de studentleerkracht versterkt het potentieel van het oppikken van evidence-based didactische aanpak in ILO's. De resultaten suggereren ook dat RPT helpt bij het ontwikkelen van self-management, samenwerking, autonomie, zelfdiscipline en zelfvertrouwen bij de studentleerkrachten. Aanvullende resultaten - voortbouwend op de focusgroepen - geven aan dat in sommige groepen studentleerkrachten eerder autocratisch en zeker niet vriendelijk waren. Dit impliceert dat een meer intensieve training van studentleerkrachten nodig is voor een versterken van hun onderwijscompetenties.

In het discussiehoofdstuk wordt doorlopend herhaald hoe de adoptie/implementatie van didactische strategieën beneden de benchmark valt. Dit introduceert een discussie over het minimale mastery niveau dat kan worden verwacht van studentleerkrachten in het algemeen en leerkrachtenopleiders in het bijzonder. Bij de bespreking van de resultaten, was het moeilijk – op basis van de literatuur - om heldere en eenduidige benchmarks te vinden om het "niveau" van adoptie/implementatie van strategieën te beoordelen. Dit is

een terugkerend probleem in onderzoek en praktijkgerelateerde literatuur. Met uitzondering van discussies over technologie competenties, is het zeer moeilijk om studies terug te vinden die expliciet minimale beheersingsniveau naar voren schuiven (zie bijvoorbeeld Davis & Kirschner, 2003; Northrup & Little, 1996).

De resultaten – uit het huidige proefschrift - kunnen gekoppeld worden aan de lange lijst literatuur waarin wordt opgeroepen tot het versterken van de leerkrachtenopleiding in het licht van de 21st Century Skills; zoals: verbetering van de eigen leerkrachtcompetenties, bereidheid om te leren, het versterken van de didactische vaardigheden en het overbruggen van de theorie-praktijk kloof in de ILO's (Darling-Hammond, 2006, Dag, 1999; Korthagen, 2005; Valcke, 2013; Zeichner, 2013). Bij de bespreking van “What is lacking in the current teacher practices?” stelt Hattie (2009, p.109-110) dat vooral het gebrek van gebruik van evidence-based strategieën in de leerkrachtenopleiding verklarend is voor de beperkte bandbreedte aan strategieën die leerkrachtenopleiders zelf oppikken.

In de voorlaatste deel van de PhD gaan we dieper in de theoretische, methodologische, praktische en beleidsbijdragen van het proefschrift.

In de sectie “beperkingen van het uitgevoerde onderzoek” wordt ingegaan op acht tekortkomingen die aangepakt kunnen worden in toekomstig onderzoek. Sommige beperkingen zijn eerder methodologische aard (bijv., de aard van het onderzoek instrumenten, de specificiteit van de onderzoekssetting, de omvang en aard van de steekproeven, ...); andere beperkingen wijzen op de noodzaak tot het opnemen van een multi-actor perspectief, de behoefte aan een duidelijke benchmark, het feit dat de didactische strategieën los werden bestudeerd van andere leerkrachtcognities. Een meer holistische benadering wordt voorgesteld.

Het laatste deel van het proefschrift gaat voorbij de grenzen van het uitgevoerde onderzoek en beschrijft een innovatief project – op te zetten in Pakistan - dat voortbouwt op de inzichten ontwikkeld in dit doctoraat. Dit project beoogt de oprichting van een centrum dat zich richt op de leerkrachtenopleiding en de toekomstige leerkrachten van secundaire scholen. In het bijzonder wil dit project een duurzame kettingreactie op gang brengen zodat er een betere leerkrachtenopleiding wordt neergezet die de kwaliteit van toekomstige leerkrachten in het secundaire onderwijs verbetert.

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Academic output

ACADEMIC OUTPUT

Output related to this dissertation

Journals (a1)

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2016). Secondary school teaching in Pakistan: the interrelationship of didactical strategies with pedagogical and self-efficacy beliefs. *PONTE*, 72(4), 181–197.

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2016). The critical state of initial teacher education in Pakistan: Need for urgent reforms. *PONTE*, 72(4), 216–236.

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A., (2016). Impact of reciprocal peer tutoring on student teachers' learning performance in the initial teacher education. Manuscript under revision for *The Journal of Experimental Education*.

Journals (a2)

Shahzad, A. H., Tondeur, J., Zulfqar, A., & Valcke, M. (2015). Exploring teacher educators and student teacher's adoption of didactical strategies in the Initial Teacher Education (ITE) programmes in Pakistan. *European Journal of Social Sciences*, 50(3), 1–11.

Conference contributions

Shahzad, A. H., Valcke, M., & Bahoo, R. (2011). *A study to analyze the teacher's perceptions about the adoption of collaborative learning in post-graduate classes of IUB*. *Procedia Social and Behavioral Sciences* (pp. 3056–3059). Presented at the 4th World Conference on Educational Sciences (WCES), Elsevier.

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2015). *A study of secondary school teachers' adoption of didactical strategies and its relationship with teachers' cognitions*. Canada International Conference on Education, Abstracts. Presented at the Canada International Conference on Education.

Shahzad, A. H., Tondeur, J., Zulfqar, A., & Valcke, M. (2015). *The adoption of didactical strategies: a survey study in Pakistan initial teacher education programmes*. 5th International Multidisciplinary Conference, Abstracts. Presented at the 5th International Multidisciplinary Conference.

Other academic output

Conference contributions (ISI indexed)

p1

Shahzad, A. H., & Khan, A. (2010). Virtual learning and students' perception-a research study. In H Uzunboylu (Ed.), *Procedia Social and Behavioral Sciences* (Vol. 2, pp. 5463–5463). Presented at the 2nd World Conference on Educational Sciences (WCES-2010), Elsevier.

Shahzad, A. H., Bukhsh, Q., & Khan, M. S. (2011). Understanding the psychology of tutor: A research study. In H Uzunboylu (Ed.), *Procedia Social and Behavioral Sciences* (Vol. 30, pp. 1534–1537). Presented at the 2nd World Conference on Psychology, Counselling and Guidance (WCPCG), Elsevier.

Bukhsh, Q., Shahzad, A. H., & Nisa, M. (2011). A study of learning stress and stress management strategies of the students of postgraduate level: A case study of Islamia University of Bahawalpur, Pakistan. In D. Ongen, C. Hursen, M. Halat, & H. Boz (Eds.), *Procedia Social and Behavioral Sciences* (Vol. 30, pp. 182–186). Presented at the 2nd World Conference on Psychology, Counselling and Guidance (WCPCG), Elsevier.

**Dat storage
fact sheets**

% Data Storage Fact Sheet

% Name/identifier study

% Author:

% Date:

1. Contact details

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1a. Main researcher

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2. Information about the datasets to which this sheet applies

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- Which datasets in that publication does this sheet apply to?
The complete dataset of the study reported in Chapter 2 of the dissertation

3. Information about the files that have been stored

=====

3a. Raw data

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If NO, please justify:

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Survey data of 250 student teachers and 32 teacher educators

- [X] researcher PC

- [] research group file server

Data storage fact sheets

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- all members of the research group
- all members of UGent
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- file(s) containing processed data. Specify: ...

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If a response is not received when using the above contact details, please send an email to data.pp@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

=====

- Reference of the publication in which the datasets are reported:

Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2016). The critical state of initial teacher education (ITE) in Pakistan: need for urgent reforms. *PONTE*, 72(4), 1–13.

- Which datasets in that publication does this sheet apply to?
The complete dataset of the study reported in Chapter 3 of the dissertation

3. Information about the files that have been stored

=====

3a. Raw data

* Have the raw data been stored by the main researcher? [X] YES / [] NO

If NO, please justify:

- On which platform are the raw data stored?
Survey data of 250 student teachers regarding 3 instruments

Data storage fact sheets

- researcher PC
- research group file server
- other (specify): External hard disk in the researcher office

* Who has direct access to the raw data (i.e., without intervention of another person)?

- main researcher
- responsible ZAP
- all members of the research group
- all members of UGent
- other (specify): ...

3b. Other files

* Which other files have been stored?

- file(s) describing the transition from raw data to reported results. Specify: SPSS files containing the clean data of student teachers responses to 3 instruments on five points Likert scale

- file(s) containing processed data. Specify: ...

- file(s) containing analyses. Specify: Files containing the descriptive analysis, one sample t-test and effect size and regression analysis are stored in word file format

- files(s) containing information about informed consent

- a file specifying legal and ethical provisions

- file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...

- other files. Specify: ...

* On which platform are these other files stored?

- individual PC

- research group file server

- other: External hard disk in the researcher office

* Who has direct access to these other files (i.e., without intervention of another person)?

- main researcher

- responsible ZAP

- all members of the research group

- all members of UGent

- other (specify): ...

4. Reproduction

* Have the results been reproduced independently?: YES / NO

* If yes, by whom (add if multiple):

- name:

- address:

- affiliation:

- e-mail:

% Data Storage Fact Sheet

% Name/identifier study

% Author:

% Date:

1. Contact details

=====

1a. Main researcher

- name: Abid Hussain Shahzad
- address: Henri Dunantlaan 2- 9000, Gent Belgium
- e-mail: abidhussain.shahzad@ugent.be

1b. Responsible Staff Member (ZAP)

- name: Martin Valcke (promoter PhD project)
- address: Henri Dunantlaan 2- 9000, Gent
- e-mail: Martin.Valcke@UGent.be

If a response is not received when using the above contact details, please send an email to data.pp@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

=====

- Reference of the publication in which the datasets are reported:
Shahzad, A. H., Valcke, M., Tondeur, J., & Zulfqar, A. (2016). Secondary school teaching in Pakistan: the interrelationship of didactical strategies with pedagogical and self-efficacy beliefs. *PONTE*, 72(4), 1–13.
- Which datasets in that publication does this sheet apply to?
The complete dataset of the study reported in Chapter 4 of the dissertation

3. Information about the files that have been stored

=====

3a. Raw data

* Have the raw data been stored by the main researcher? [X] YES / [] NO

If NO, please justify:

- On which platform are the raw data stored?
Survey data of 395 secondary school teachers on 3 instruments

- [X] researcher PC
- [] research group file server
- [X] other (specify): External hard disk in the researcher office

* Who has direct access to the raw data (i.e., without intervention of another person)?

- main researcher
- responsible ZAP
- all members of the research group
- all members of UGent
- other (specify): ...

3b. Other files

* Which other files have been stored?

- file(s) describing the transition from raw data to reported results. Specify: SPSS files containing the clean data of secondary school teachers' responses to 3 instruments on five points Likert scale
- file(s) containing processed data. Specify: ...
- file(s) containing analyses. Specify: Files containing the descriptive analysis, one sample t-test, effect size and regression analysis are stored in word file format
- files(s) containing information about informed consent
- a file specifying legal and ethical provisions
- file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
- other files. Specify: ...

* On which platform are these other files stored?

- individual PC
- research group file server
- other: External hard disk in the researcher office

* Who has direct access to these other files (i.e., without intervention of another person)?

- main researcher
- responsible ZAP
- all members of the research group
- all members of UGent
- other (specify): ...

4. Reproduction

=====
* Have the results been reproduced independently?: YES / NO

* If yes, by whom (add if multiple):

- name:
- address:
- affiliation:
- e-mail:

% Data Storage Fact Sheet

% Name/identifier study

% Author:

% Date:

1. Contact details

=====

1a. Main researcher

- name: Abid Hussain Shahzad
- address: Henri Dunantlaan 2- 9000, Gent Belgium
- e-mail: abidhussain.shahzad@ugent.be

1b. Responsible Staff Member (ZAP)

- name: Martin Valcke (promoter PhD project)
- address: Henri Dunantlaan 2- 9000, Gent
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If a response is not received when using the above contact details, please send an email to data.pp@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

=====

- Reference of the publication in which the datasets are reported:
- Shahzad, A. H., Tondeur, J., Zulfqar, A., & Valcke, M. (2016). Reciprocal Peer Tutoring to innovate initial teacher education: Exploring mediating effects of self-efficacy, intrinsic motivation and metacognitive awareness. Paper submitted for publication.
- Which datasets in that publication does this sheet apply to?
The complete dataset of the study reported in Chapter 5 of the dissertation

3. Information about the files that have been stored

=====

3a. Raw data

* Have the raw data been stored by the main researcher? [X] YES / [] NO

If NO, please justify:

- On which platform are the raw data stored?
Survey data of 48 student teachers on three mediating variables (Intrinsic motivation, Self-efficacy, metacognitive awareness) and learning performance test scores

- [X] researcher PC

Data storage fact sheets

- research group file server
 - other (specify): External hard disk in the researcher office
- * Who has direct access to the raw data (i.e., without intervention of another person)?
- main researcher
 - responsible ZAP
 - all members of the research group
 - all members of UGent
 - other (specify): ...

3b. Other files

-
- * Which other files have been stored?
- file(s) describing the transition from raw data to reported results. Specify: SPSS files containing the clean data of student teachers responses to 3 instruments on five points Likert scale and their learning performance scores
 - file(s) containing processed data. Specify: Focus group (5 students) responses to open ended questions about RPT processed on a chart and saved as Jpg image file
 - file(s) containing analyses. Specify: Files containing the descriptive analysis, ANCOVA and effect size are stored in word file format
 - files(s) containing information about informed consent
 - a file specifying legal and ethical provisions
 - file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
 - other files. Specify: ...
- * On which platform are these other files stored?
- individual PC
 - research group file server
 - other: External hard disk in the researcher office
- * Who has direct access to these other files (i.e., without intervention of another person)?
- main researcher
 - responsible ZAP
 - all members of the research group
 - all members of UGent
 - other (specify): ...

4. Reproduction

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- * Have the results been reproduced independently?: YES / NO
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- name:
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 - e-mail:

