Reciprocal Peer Tutoring and Innovation of Initial Teacher Education in Pakistan: Looking Through an Experimental Lens

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Abstract   *The current quasi-experimental pre-test post-test study involved master level students enrolled in a teacher education program. The Learning performance test was administered together with survey instruments on intrinsic motivation, metacognitive awareness, and self-efficacy beliefs. Analysis of covariance of results points at a positive significant differential effect of reciprocal peer tutoring on student teachers' learning performance. However, no interaction effect was observed in mediating variables. Post-reciprocal peer tutoring interviews were organized to analyze students and teachers' reflections about reciprocal peer tutoring. Implications are presented to educational psychologists, teacher educators, and educational policymakers with recommendations to model collaborative learning approaches; such as reciprocal peer tutoring.*

Key Words

Collaborative Learning,
Peer Tutoring; Teacher
Preparation; Learning
Performance

Introduction

Research stresses that what student teachers experience during their ITE programs, will influence their future teaching 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). The available research, therefore, criticizes the efficacy and efficiency of ITE programs 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 a 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? 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 programs (see e.g., Grover, 2015; Hattie, 2009; Smith & Lev-Ari, 2005; Walkington, 2005). Author (see, e.g., Valcke, 2013) present collaborative didactical approaches as the key strategy that activate and foster student learning.

Building on the above, and especially the observation there is a lack in the adoption of active and collaborative didactical strategies by student teachers, reciprocal peer tutoring (RPT) was put forward as a teacher education didactical strategy.

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. RPT has been adopted 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 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 programs stress - at theoretical level - student-centered, 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 labeled 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). Other authors add to this that the implementation of student-centered 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).

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. 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, Neckebroeck, 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 contributes 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, Van Keer, & Valcke, 2012). Authors also stress the importance of "tutor training" to guarantee proper implementation of RPT strategies (Dioso-Henson, 2012; Topping, 1996; Valcke, 2013).

Research Design

Hypothesis

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, we put forward the following hypothesis:

Students in the RPT condition will attain a significantly higher learning performance scores as compared to

students in the control condition.

Participants

Participants were final year pre-service student teachers enrolled in a two year M.An Education program at Bahauddin Zakariya University Multan Pakistan. 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.

Procedure

Prior to (t0), in the middle (t1) and at the end of the research period (t2), 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 was 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.

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. 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.

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

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 performance test consisted of three types of questions: (1) multiple-choice questions; (2) short answer questions and (3) essay type questions.

   In view of the post-test interviews, students were invited to give their opinion 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 quantitative and qualitative data.

Analysis Approach

To analyse 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 20 (IBM SPSS, 2012). A p-value of $p< .05$ was put forward. Given the small samples size in the present study, we look at the 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.

   Interviews responses were analyzed 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 interview question. Intra-ratter reliability was calculated after re-analyzing – two weeks later - the student answers. Two experts ratters were assigned the task and they had to re-read the interviews. Cohen's Kappa analysis was carried out as the result (.73) indicates substantial agreement reliability.

Results

Descriptive Results

In table 1, we summarize the descriptive results (Mean & SD) for the learning performance at pre-test, mid-test, and post-test:

Table 1. Descriptive Statistics for Learning Performances (LP) (N= 48) at pre, mid and post-test level

Variables	Conditions	Pre-test (N=48) Mean (SD)	Mid-test (N=48) Mean (SD)	Post-test (N=48) Mean (SD)
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)

The initial learning performance in the experimental and control group hardly differs at t0. The results in Table 1 suggest clear changes in learning performance in both the experimental and the control group at t1 and t2. The figure 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
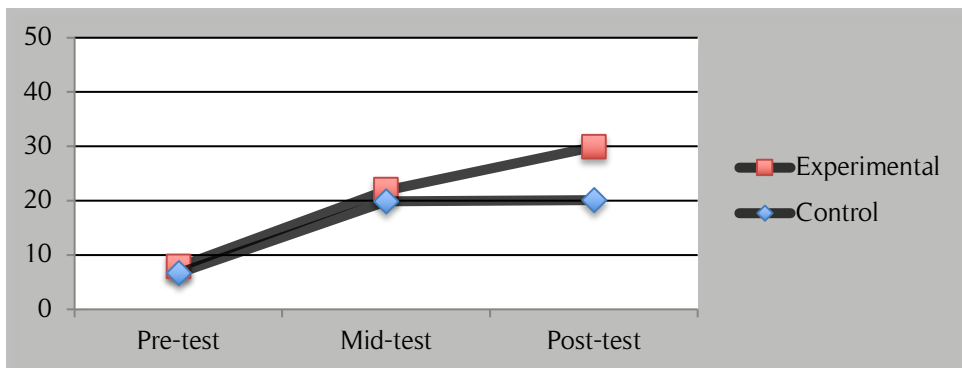

Figure. Changes in student teachers' learning performance at pre, mid and post test

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 2, 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 t0 ($F_{(1,46)}$=2.57, p=.11, d= 0.4), and no significant differences at t1 ($F_{(1,46)}$=0.35, p=.56, d= 0.1). But the within-subject contrast analysis of learning performance reiterate the significant differences observed above at t2 ($F_{(1,46)}$= 9.16, p<.01), d= 0.9). Cohen's d reflects a larger effect size.

Analysis of the Focus Group Interviews

After finalizing the RPT intervention, students and teachers were invited from each group to take part in the interview. In total five students from five different RPT groups were agreed to take part in the interviews. Above we already listed the five key questions asked to each of the students. Analysis of student answers resulted in the identification of some critical themes and thus the intra-ratter reliability was calculated as explained in the result section.

Discussion and Conclusions

In the current research study, we aimed at exploring the differential impact of RPT on student teachers' learning performance. 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 Angelique 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).

In the figure, we can see how initially no differences in learning performance can be observed between both research groups at t1. The qualitative data help to explain 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 interviews.

The interview 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 interviews 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-centered' 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-centered 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.

The findings of the current study put forward implications for teacher education and educational policymakers. 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 the 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).

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

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