Computers & Education 72 (2014) 48–58

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Student teacher communication and performance during a clinical experience supported by a technology-enhanced cognitive apprenticeship

Theodore J. Kopcha [a,*], Christianna Alger [b]

[a] Department of Career and Information Studies, University of Georgia, Athens, GA 30602, United States
[b] San Diego State University, United States

ARTICLE INFO

Article history:
Received 14 June 2013
Received in revised form
23 September 2013
Accepted 24 October 2013

Keywords:
Technology enhanced cognitive apprenticeship
Online discussion board
Teacher supervision

ABSTRACT

This study is the third in a series of design-based research on a technology-enhanced cognitive apprenticeship (TECA) that uses a variety of technology (e.g. video, discussion boards, performance support) to support triad member activity during the clinical experience. The purpose of this study was to examine the differences in communication and performance among student teachers who participated in the TECA during a year-long clinical experience and those who did not. Overall, performance scores were higher among students in the TECA; planning scores were higher at a statistically significant level. Communication reports suggest that online discussions through both public and private channels contributed to these results. Findings were consistent with prior studies of the TECA and supported the efficacy of key design elements. Implications for teacher education and the design of TECAs are discussed.

1. Introduction

There is a clear and growing call to improve the supervision of student teachers during the clinical experience with technology. The National Council for Accreditation of Teacher Education's Blue Ribbon Panel (Blue Ribbon Panel, 2010) suggested that teacher preparation should include opportunities to participate in a larger community of learners connected through technology. Gomez, Sherin, Griesdorn, and Finn (2008) and Lieberman and Mace (2010) similarly suggested that student teachers would benefit from making use of technology to receive feedback and share experiences with a wider variety of peers and experts. These uses of technology seek to achieve a common goal – to improve the preparation of teachers by improving dialog and discourse about teaching practice among student teachers and their community of experts and peers.

The call to improve teacher preparation stems from longstanding issues with the triad model (student teacher, cooperating teacher, and supervisor) commonly associated with teacher supervision. The triad model is an apprenticeship model in which a student teacher learns under the guidance of a practicing teacher – that is, the cooperating teacher – in the field. The student teacher is typically monitored and periodically observed by a supervisor from the university to determine whether he or she has demonstrated the knowledge and skills needed to earn a teaching credential. A common issue with the triad model is that the underlying cognitive processes associated with teaching are not consistently demonstrated or communicated to student teachers by the experts in their triad (Feiman-Nemser, 2001; Tang, 2003; Valencia, Martin, Place, & Grossman, 2009). Cooperating teachers and supervisors are often provided little guidance or support for helping student teachers make practical use of the theories they learn at the university (Darling-Hammond, 2006; Levine, 2011; Zeichner, 2010). Student teachers are often left to make meaning of their clinical experience without the support of experts (Fisch & Bennett, 2011). As a result, the clinical experience becomes highly variable in quality and efficacy across student teachers and the institutions that prepare them to teach (Darling-Hammond, 2006).

Technology-enhanced cognitive apprenticeships (TECA) have the potential to address the problems that triad members encounter during the clinical experience and, in turn, the quality of teacher supervision. A technology-enhanced cognitive apprenticeship is an environment

* Corresponding author.
E-mail address: tjkopcha@uga.edu (T.J. Kopcha).

0360-1315/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.compedu.2013.10.011

where the theories and methods of cognitive apprenticeship (e.g. modeling, coaching, scaffolding, reflection, and community-building) are used as a framework for incorporating technology into the clinical experience and improving learner outcomes (Ghefaili, 2003; Wang & Bonk, 2001). A cognitive apprenticeship is different from a traditional apprenticeship in that the skills that a novice must learn are not fully observable – rather, the focus is on learning the underlying cognitive processes that others have come to master (Collins, Brown, & Holum, 1991). This draws heavily upon Vygotsky's (1978) work in socio-cultural theory. Under this theory, learning occurs through frequent dialog with oneself and others. Dialog helps learners better understand the meaning of knowledge and its relationship with the social and cultural norms within a given context. Technology serves as a tool for learners to connect this knowledge with the world in which they live. Thus, TECAs have the potential to improve the clinical experience by generating rich dialog about teaching and teaching practices as they are occurring during the clinical experience.

Many TECAs focus on improving the methods of cognitive apprenticeship – in particular, coaching and feedback. Some researchers have reported positive results from this focus (see Jetton, 2004; Lee & Wu, 2006; Liu, 2005; White & Cornu, 2002; Wu & Lee, 2004). For example, White and Cornu (2002) found that 120 student teachers experienced lower levels of stress during the clinical experience when they used email communication to receive support and advice from peers and experts. Others, however, have reported that their use of technology did little to improve teacher learning or performance (Clift, Mullen, Levin, & Larson, 2001; Levin & Waugh, 1998; Pratt, 2008; Price & Chen, 2003). Price and Chen (2003) reported that their attempt to use online discussions to improve coaching and feedback during the clinical experience resulted in very little communication among participants.

One reason for these mixed results may be the manner in which a TECA is designed. Participants are more likely to derive benefits from a TECA when they understand what they are expected to do and have ample support when doing it (Clift et al., 2001; Fisch & Bennett, 2011). A TECA that focuses solely on coaching and feedback, then, may not improve teacher outcomes because participants may not know what to discuss or how to do so effectively. Ghefaili's (2003) framework suggests that a successful TECA consists of three essential elements of cognitive apprenticeship: the methods, content, and social aspects of learning. It is likely that student teachers immersed in such an environment would have greater and more purposeful exposure to the thinking of experts and peers than one that focuses more narrowly on increasing the frequency of coaching and feedback alone.

There is limited but promising evidence that TECAs built around multiple elements of cognitive apprenticeship can improve teacher outcomes (Fisch & Bennett, 2011; Lee & Wu, 2006; Liu, 2005; Sherin & van Es, 2005; Wu & Lee, 2004). Wu and Lee (2004) found that 37 student teachers were better able to evaluate their own and others' teaching habits after engaging in a TECA that offered instructional modules, private discussion with experts about their own teaching, and public discussion about teaching with the broader community of experts and peers. Liu (2005) found that 24 student teachers were significantly better at planning and had more positive attitudes about teaching after participating in a web-based environment that embedded online coursework, modeling and coaching, and performance support into the clinical experience. Fisch and Bennett (2011) reported that 16 student teachers exhibited deeper reflection and critical thinking about their own teaching practice during the clinical experience when their online discussion was guided by specific course assignments. These results suggest that TECAs can be used effectively to improve student teacher performance when designed to provide all triad members with support and guidance as they engage in apprenticeship activities.

1.1. Purpose

Making practical use of prior studies of TECAs is problematic. Many studies fail to clarify if or how a TECA was integrated within existing student teacher coursework (Hammond, 2005). More problematic is a reliance on qualitative accounts of teacher's attitudes toward technology or feelings about their learning rather than their teaching performance (Gentry, Denton, & Kurz, 2008). Studies that do focus on teaching performance often fail to account for factors outside the TECA that can influence one's ability to teach (Gentry et al., 2008; Kopcha & Alger, 2011). Far fewer examine the communication choices of learners while engaged in TECAs (Clift et al., 2001). There is a need for research that examines communication and performance among student teachers engaged in a TECA during the clinical experience. Examining the relationship between communication and performance will not only address this need but also help to establish empirically-based design principles for developing TECAs (Dennen & Burner, 2008, pp. 425–439; Hixon & So, 2009).

The purpose of this study was to examine the difference in communication and performance among student teachers who participated in a TECA during the clinical experience and those who did not. The TECA, called eSupervision, is an instructional program that uses technology to enhance the methods, content, and social aspects of cognitive apprenticeship to support triad members during the clinical experience. The program has been studied as part of an ongoing design-based research effort because of the focus on developing a theory-driven instructional solution to a specific problem in a local context (Reeves, Herrington, & Oliver, 2005). This study examines the third iteration of that effort. Studying educational phenomena over multiple iterations of an instructional design effort offers insight into the efficacy of design decisions as well as practical considerations for enacting them in applied contexts (Reeves et al., 2005).

In the prior iteration of eSupervision, Kopcha and Alger (2011) examined the teaching performance and attitudes of 38 student teachers. Though the difference was not statistically significant, eSupervision students performed better than non-eSupervision students on a statewide test of their teaching knowledge and ability. Cooperating teachers and supervisors, however, struggled to provide timely and meaningful feedback using the assessment tool embedded within the online system. The authors noted that this issue was a factor that may have contributed to the lack of statistical significance.

The current study first replicates the prior study by examining the effects of a TECA on student teacher performance during the clinical experience. Performance scores were compared between two cohorts of student teachers – one that received eSupervision and one that did not. Teacher self-efficacy and the quality of guide teaching were accounted for in the research design because of their influence on student performance during the clinical experience (Tang, 2003; Tschannen-Moran & Hoy, 2007).

The current study also improves upon the previous study in several ways. First, the current study introduces a mechanism for providing student teachers with more timely and relevant coaching and feedback through private discussion boards. Since the current iteration is the first to make use of private discussion boards, the results of this study provide much needed insight into the effects of specific designs