Integrating Technology in the Classroom: Factors that Account for Teachers’ Regressive Developmental Trajectories

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ABSTRACT

In this article, the authors studied the developmental trajectories of three teachers as they integrated GroupScribbles (GS) technology in their classroom lessons over a semester period of about 5 months. Coherency diagrams were used to capture the complex interplay of a teacher’s knowledge (K), goals (G) and beliefs (B) in leveraging technology effectively in the classroom. The degree of coherency between the KGB region and the affordances of the technology provided an indication of the teacher’s developmental progression through the initiation, implementation and maturation phases of using technology in the classroom. The author’s findings reveal that a low coherency state at the initial stage not only has a high tendency for single regression to happen but also a double regression, when further triggered by certain factors. Dominant stagnation among the low coherency states throughout the initial and implementation phases increases the difficulty of upward transition to high coherency states. Implications are drawn as to the importance of ensuring high coherency during the initial phase where opportunities for synergy between a teacher’s KGBs and the affordances of the technology should be created as early as possible to minimize regression.

Keywords: Computer Supported Collaborative Learning, Group Scribbles (GS), Teacher Change, Technology in the Classroom, Technology Integration

INTRODUCTION

The emergence into the 21st century necessitates communication, information and skill sets that are embedded in technology-rich environments and settings. Given this shift, it is imperative that education must shift to incorporate computer-based technologies that integrate learning within the context of the academic subject areas. In this paradigm, teachers play a central role in integrating technology effectively into classroom learning. Educational research indicates that there are many elements such as teacher knowledge, curricula, teacher goals and social
factors that influence teacher practices including the use of technology in the classroom (Song & Looi, submitted; Borko, 2004). Teacher beliefs have been found to be a strong determinant of how teachers make use of these elements in their teaching practices (Speer, 2008). Indeed, studies have shown that there is a strong correlation between teacher beliefs and teacher practices (e.g., Beyer & Davis, 2008; Chen, Looi, & Chen, 2009; Crawford, 2007; Speer, 2008; Wallace & Kang, 2004).

In our previous papers (Chen, Looi & Chen, 2009; Chen, Looi & Chen, 2010; Chen & Looi, 2008), we argued that the coherency between teacher’s knowledge (K), goals (G) and beliefs (B) and the affordances of the technology is the main key in leveraging the technology successfully. Using the Coherency diagrams (Chen, Looi & Chen, 2009) to examine the developmental trajectories of two primary (elementary) school teachers, we postulated several possible assertions that account for the regressive trajectories exhibited by teachers who are less successful in using technology in the classroom. In this paper, we investigate and analyze teacher Roy who has also exhibited a similar regressive trajectory albeit teaching in a different school context. By comparing their developmental trajectories vis-à-vis the Coherency diagrams, we obtain more insights into developing teacher’s competencies in using technology in the classroom.

THE COHERENCY DIAGRAM

According to Schoenfeld (1999, 2006), a teacher’s decision-making and problem solving is a function of the teachers’ knowledge, goals and beliefs. The teacher’s knowledge, goals and beliefs influence each other in a complex manner in every decision process embarked on by the teacher in the classroom. In seeking to represent the complex interplay between teachers’ knowledge (K), goals (G) and beliefs (B), we have devised the “KGB diagram” (Figure 1).

In our study, the teacher’s beliefs (B) concern teachers’ views about nature of knowledge and how knowledge is learned (Hofer & Pintrich, 1997). These conceptions of knowledge impact the teaching practices of a teacher and his or her views about students’ learning (Brownlee et al., 2002). Goals (G) are what a teacher sets to accomplish in class (Schoenfeld, 1999) and can be intrinsic to the teacher and coherent with his or her beliefs or they can be imposed upon the teacher by the school, community or other stakeholders. The knowledge of a teacher (K) includes content knowledge, pedagogical content knowledge and knowledge of the students (Brandsford et al., 2000).
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