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Supporting beginning teachers' case–based learning in a technology-mediated learning environment

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The current challenge faced by most beginning teachers is the disparity between the theories of classroom management exposed to in pre-service, and the practices in complex and ill-structured classroom situations. Such a theory-practice gap has led to the need to re-examine the existing instructional approach used in teacher learning and helping them develop deep understanding and meaningful learning for teachers. This proposed study explores case-based learning and related areas, beginning teachers' case-based learning for self-analysis, discussion and reflection. It also explores how technology can be used to support teachers' case-based learning. The affordances of technology and design of technology-mediated learning environment will also be presented.

Keywords: Case-based learning, classroom management, teacher learning

Introduction

Cases are a natural and powerful formalism for storing and describing experiential knowledge that is essential to problem solving (Jonassen & Hernandez-Serrano, 2002). Cases are authentic situations that are contextually rich and highly memorable for learners (Bonk & Zhang, 2008). It is important to take note of the characteristics of case-based learning (CBL) and case-based reasoning (CBR). As an instructional design model, CBL is inquiry oriented that involves either self-directed analysis or collaborative knowledge construction of specific situations based on real-world examples. CBL is deemed as an effective learning approach that bridges the gap between theory and practice (Flynn & Klein, 2001), facilitates the application of knowledge in real world problem solving (Choi & Lee, 2009) and builds advanced tacit knowledge and expertise that is difficult to convey using traditional and didactic instruction (Wang, 2002).

CBL has its roots in CBR in the computer science discipline and constructivist approaches in the education domain (Kolodner, Owensby, & Guzdial, 2004). CBR postulates that situated learning in real-life experience is the most effective and natural mode of learning. It emphasizes learning from experience (which may be direct or indirect experience) and applying the knowledge and skills learnt from experience (or from a case) to other situations. In CBR, cases are the central foci in learning. Generally, in CBL design, learners identify the issues and factors in a case, interpret and reflect on the issues, discuss their viewpoints with others, provide feedbacks to others, receive feedback for their comments during case discussion which focuses on their analysis, experiences, and personal knowledge (e.g., Laframboise & Griffith, 1997, Kim & Hannafin, 2009, Wang, 2002). By participating

in case-based discussion with other learners, the learners refine their knowledge and experiences that are beyond their personal experience. CBL is grounded on constructivist approaches where knowledge is constructed, built on prior knowledge that provides students with insights into alternative solutions (Harrington,1995).

Beginning teachers' case-based learning

Beginning teachers, the first year teachers (also referred to as novices), have limited classroom interactions with students and teaching experience in formal school context. The real-life context and experiences of cases are used to situate teachers' learning. More importantly, case-based learning facilitates generalization of the application of knowledge, skills and experiences learnt in case discussion over a broad range of situations (Levin, 1995). In fact, diverse experiences and tacit knowledge gained through repeated application of knowledge and skills are the characteristics that distinguish between experts and novices (Kolodner, 1993, Kim &Hannafin, 2009).

Case-based learning has been found to help beginning teachers develop expertise and professionalism that experts evolve through the accumulation of experiences. The situated learning experience and inquiry gained through case discussion have potentially contributed towards building the personal knowledge of novice teachers. When they become more aware of these experiences, their sense of professional identity could be established (Harrington, Quinn-Leering, & Hodson, 1996). Case-based learning provides beginning teachers the opportunity to take after experts' footstep in interpreting issues, making decisions and conceptualizing action plans, which will allow them to initiate their transition to the teaching community (Kim & Hannafin, 2009). Also, case-based learning for teachers should be meaningful. Several researchers have defined characteristics such as active, self-directed, collaborative and reflective to be critical in meaningful learning (Jonassen, Howland, Marra, & Crismond, 2007).

How technology supports teachers' case-based learning

The incorporation of technology into case-based learning involves understanding the affordances of technology and the constructivist learning environment. Researchers have identified pedagogy, technology and psycho-socio dimensions to consider when designing the constructivist learning environment (Wang , 2008; Quek, 2009). Two examples of constructivist learning environments include case-based e-learning and web-enhanced case-based learning which have been developed for use in teacher education. Pedagogical design of the environment allows for active learning and co-construction of knowledge among learners. Technological design allows for learner access anytime and anywhere and the ease of use of technological tools such as discussion forums, chats and Skype to support learners' learning. Psycho-socio design of the environment focuses on both the environment (be it face-to-face or Web-based) and its interaction with the personal characteristics of the learners that determine the behavior of individuals.

Two recent research studies have highlighted usefulness and concerns of teachers' case-based learning supported by technology. Choi and Lee (2009) developed an online case-based learning to enhance prospective teachers' classroom management problem solving skills (CBL-CMPS). The results indicated that the environment was effective in helping prospective teachers see the different aspects of a dilemma, as well as the alternatives solutions to the problems. They also demonstrated improvement in case justification and in linking theory to practice with the graduated scaffoldings and learning resources provided. The ultimate objective of this learning environment is to promote internalization of problem solving skills through a cycle in which students repeatedly practice problem solving skills with different cases under a guided and well designed learning environment.

Kim and Hannafin (2009) showed how computer supported case-based learning aided prospective teachers in understanding and gaining experts' knowledge, as well as provided them the opportunity to articulate and envision their thinking and plans for real teaching. Generally, prospective teachers reported that the activities are useful and expressed willingness and confidence to use them in the future. They also found the cases and templates useful for them to gain a more concrete idea about the teaching contexts, teachers' role, student characteristics, and educational strategies. Additionally, they indicated an intention to apply what they learnt in the cases to new situations. However, reflection about the case was overlooked by these teachers. Generalization of expert knowledge from the case to

planning was also limited, which might be caused by the different focus between the case and the project the prospective teachers assigned to.

The use of Wiki in K-12 teaching and learning has received much attention. Hew and Cheung (2009) highlighted two key features: the asynchronicity and traceability found in wiki. It was also reported that four main factors influenced the users' use of wiki: usability, pedagogical issues, social environment, and students' technical knowledge and skills. These key features and factors could potentially indicate further research in the area of using wiki to support teachers' case-based learning. Among the potential uses of wiki in education, as highlighted by Duffy and Bruns (2006), the affordance of wiki as a collaborative tool for participants to brainstorm ideas, document discussion activity past or present, reflect on learning has indeed provided evidence of how wiki can be deployed to support teachers' learning.

Proposed study

Beginning teachers' growing challenges faced in managing classrooms in schools has led us to rethink the instructional approach adopted in teaching classroom management. The instructional approach is not mere memorization of facts, acquisition of skills and learning cognitive knowledge. Research has informed us that different types of knowledge such as advanced knowledge and expertise might be better learnt through alternative learning approaches, such as case-based learning (Quinn, Anderson, & Finkelstein, 1996, Wang, 2002).

A two and a half year mixed method study was proposed and it would be implemented in three phases in six secondary schools. The first phase focuses on the writing of 100 beginning teacher-participant generated cases for self-analysis of classroom management concepts and approaches. The second phase focuses on presenting a self-generated case for discussion in Web-based learning environment with peers and experts, followed by self-reflection. The Web-based tool to be used to support teachers' case-based learning will be a wiki which has incorporated features such as ease of use, social orientation, asynchronicity and traceability. A literature review on how wiki supports teachers' learning would be conducted. A pre and post survey on teachers' classroom management behaviour in phase one will also be conducted. A self- report will be conducted to find out their classroom encounters in phase one and only selected ones will be invited for phases two and three. About 20 teachers with their selected cases will participate in case discussion. Focus group interviews will be conducted at the beginning and at the end of phase three. The third phase investigates teachers' actual classroom practice followed by self-analysis and self-reflection.

Conclusion

The review of literature was conducted in three parts with the focus on case-based learning, how it can support teacher learning and how it can be supported by technology, in particular, wiki. As this research is still in its infancy, the review of literature on case-based learning, as an alternative pedagogy in beginning teachers' learning, highlights its potential to foster teachers' higher-order thinking ability and deeper understanding of their classroom cases. Literature reviews have also highlighted the affordances of technology and how the constructivist learning environment should be taken into account in designing such technology-mediated learning environment. For the proposed three-phases study that would be conducted, teachers' use of own generated written cases for case discussion, reflection and will be supported by wiki and facilitated by researchers.

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