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Teaching in flipped classrooms: Exploring pre-service teachers' concerns

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ABSTRACT

To effectively promote the student-centered movement, it is important to understand pre-service teacher concerns about teaching in technology-integrated flipped classrooms. This study surveyed more than 470 pre-service teachers' concerns on teaching with flipped learning instruction. To understand the role of individual differences, personal characteristics such as self-efficacy for teaching, teacher knowledge, and other demographics were investigated. The results indicated the pre-service teachers had mostly self-concerns. Self-efficacy and non-technological teacher knowledge were associated with most stages of concern. Females had more awareness and management concerns; non-science pre-service teachers had more information, personal, and collaboration concerns; seniors had the highest awareness for flipped classrooms, and the effects of other personal characteristics on stages of concern were identified. The significant findings draw implications for teacher educators and teacher education programs in updating curriculum and instruction so as to equip pre-service teachers with the essential knowledge and skills for teaching effectively in 21st century classrooms.

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1. Introduction

Even though student-centered instruction has long been advocated, teacher preparation programs continue to promote ineffective instructional strategies that do not address the needs of our changing world (Sykes, Bird, & Kennedy, 2010). One type of instructional approach, flipped learning instruction (FLI), is an effective approach to promote student-centered instruction (Hamdon et al., 2013). The idea of FLI is not new. Decades ago, it was advocated as a way to engage students with different learning styles and motivation levels (Lage, Platt, & Treglia, 2000). Due to a renewed emphasis on student-centered instruction alongside the emergence of user-friendly and cost-efficient instructional technologies, FLI has returned as a viable pedagogical approach and one that addresses the needs of today's generation of learners (Vaughan, 2014).

Facilitating FLI requires considerable skills to select appropriate instructional strategies and integrate digital tools for learning. To equip pre-service teachers (PST) with essential knowledge and skills to effectively teach with FLI, it is necessary for teacher educators and teacher preparation programs to understand PST concerns. Understanding the concerns can inform the design of teacher education programs in developing appropriate curriculum and encouraging teacher educators to model contemporary instructional approaches themselves. This will promote the likelihood of teacher candidates adopting FLI so as to facilitate meaningful hands-on learning with their students. To further these goals, this study investigated the patterns of PST concerns and explored their individual differences' on the concerns.

2. Theoretical framework

2.1. Flipped learning instruction

FLI has gained attention in recent years due to the emergence of the Khan Academy, which collaborated with Microsoft to create a digital video learning library for K-12 students. Digital video libraries provide accessible content resource for student learning, allowing classroom time to be devoted to active learning. FLI is characterized by the use of technology-enhanced learning in and out of the classroom (Hamdan, McKnight, McKnight, & Arfstrom, 2013). FLI is also referred to as the inverted classroom, reversed instruction, and blended learning (Bergmann & Sams, 2012). In FLI,

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students access and view lectures on the content before coming to class, and then teachers maximize the face-to-face classroom time to guide students in actively solving problems, lead discussions, and enrich students' learning experiences.

FLI has re-emerged for good reason. In traditional classrooms, teachers tend to lecture with little interaction with students. In fact, some university-level students can earn acceptable grades without attending classes (Forsey, Low, & Glance, 2013). Teachers often have difficulty maintaining students' attention in classrooms under lecture conditions (Pinto et al., 2012). Having students learn the content outside of class and then engage in active learning, problem solving, and critical thinking will likely may address their disengagement with lectures and promote their learning and academic achievement (Finn & Zimmer, 2012).

Although models for FLI are diverse, they share common features. In FLI, teachers provide electronic resources and information for students to preview subject matter content before they come to class. Online video or audio recordings of lectures, Internet resources, and/or slide presentations with audio narratives are often used to provide the content (Hamdan et al., 2013). A few studies have found that FLI is more effective than lecture due to increased student engagement through hands-on activities. For example, Strayer (2012) found that FLI students were "more open to cooperation when compared with traditional classroom students for both their preferred learning environment and their actual classroom experience" (Strayer, 2012, p. 190). On the other hand, critics of FLI (Bergmann & Sams, 2012; Hamdon et al., 2013) fear that digitized lectures may replace the need for teachers. Critics also worry that the required digital access may widen the digital divide among students (Forsey et al., 2013). In summary, the re-emergence of FLI as an alternative to transmissive modes of teaching (Johnson, Adams Becker, Estrada, & Freeman, 2014) warrants the following research questions: What levels of concerns do PSTs have about teaching in flipped classrooms? And what are the individual differences related to the concerns?

2.2. Teacher concern

This study adopted Hall and Hord's (1987) Concern-Based Adoption Model (CBAM) as a theoretical framework to investigate PSTs' concerns about FLI. CBAM is widely adopted in research studies and provides a useful framework for analyzing concern about innovative practices (Al-Rawajfih, Fong, & Idros, 2010).

According to CBAM framework, concerns are related to the demands required of change or innovation (Hall & Hord, 2011), even though change can create opportunity to improve student learning. Adopting an innovative practice may also be considered risky because of its unfamiliarity and unpredictable consequences. Teachers' concerns can either facilitate or impede the implementation of the innovation (Hall & Hord, 1987). Teacher concern is defined as teachers' beliefs and feelings towards an innovation (Fuller, 1969). Furthermore, stages of concern often change over time and do not necessarily progress sequentially (Hall & Hord, 2011). Levels of concern occur in stages and are considered hierarchical and developmental. The categories of concern are self, task, and impact on students. Internal concerns are those related to self, and external concerns are related to task implementation and impact on student learning (Fuller, 1969). Unless internal concern is addressed, teachers usually will not proceed from internal to external concerns. On the other hand, external concerns are important in classrooms and can help teachers improve their professional practices (Fuller, 1969; Hall & Hord, 2011). To ensure that teachers successfully improve their practice through adopting innovative teaching and learning strategies, their concern about innovation (FLI) need to be addressed.

Based on Fuller's (1969) categories of concern, Hall, George, and Rutherford (1977) created the Stages of Concern (SoC) Questionnaire to assess concern about innovation. The SoC defines concern as consisting of seven stages, which are further categorized into unrelated, self, task, and impact concerns (Hall & Hord, 1987). With Fuller's model as the framework, Hall and Hord (1987) suggested the CBAM Model present seven stages of concern with four categories. In Stage0 (awareness), teachers have little involvement in the innovation and are concerned about other things. In Stage1 (informational), teachers have no or limited information about the requirements of the innovation, including implementation requirements. In Stage1, they are more interested in learning about the general characteristics and usage requirements of the technology and are less concerned in how the innovation may influence them personally. On the contrary, in Stage2 (personal), teachers' concern focuses on how they will be personally impacted by the requirements of the innovation and their ability to implement it. In Stage3 (management), teachers' concern focuses on the operation and the process of implementing the innovation. The concern is pragmatic and involves how to effectively implement the innovation and manage information and resources. In Stage4 (consequence), concern centers on the impact of the innovation on student learning. In this stage, teachers often seek ways to improve the effectiveness of the innovation, including appropriate evaluation of student performance. In Stage5 (collaboration), teachers' concern converges on coordination and collaboration with stakeholders, regarding how to work with others in implementing the innovation. In Stage6 (refocusing), teachers consider how to modify the innovative practice to suit instructional and learning needs. Stage6 concentrates on the exploration of alternatives to the existing innovation. The intensity of stages ranges from lower internal, which includes Stage0, Stage1, and Stage2, to higher external, which includes Stage3, Stage4, Stage5, and Stage6. The nature of the stages may overlap and are not exclusive of each other.

Boz's (2008) study investigating PST concern on the general practice of teaching, found that PSTs tended to have higher levels of concern in self- or task-related concerns. Calmak (2008) also studied teachers' concerns about the teaching process and found highest concern to be classroom management. Females had higher levels of concern on classroom management than males, although the gender effect was low. The PSTs who were further along in their training program had lower levels of concern. Chen and Jang (2014) surveyed secondary teachers' concern on Web 2.0 integration. Their teachers had the lowest concern levels within the stages of awareness, management, and collaboration respectively. The highest levels were in the stages of refocusing, informational, and personal respectively. Their findings implied that the teachers were most interested in learning how to modify the innovative practices to suit their teaching style and how the change would impact them individually. Furthermore, the researchers explored the relationship of teachers' concern with teacher knowledge. They found that the informational, personal, collaboration, and refocusing stages of concern were positively related to teachers' knowledge, and the awareness stage was negatively related to all of the knowledge types. The management stage was negatively related to technological knowledge (TK) and did not indicate any significant correlation with other types of knowledge.

2.3. Teacher characteristics

2.3.1. Teacher self-efficacy

Self-efficacy is defined as a person's attitude or feelings about his or her own ability to undertake some task (Bandura, 1994). Teacher self-efficacy pertains to a teacher's perception about his or

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