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Informal Technology Coaching: Using Pre-Service Teacher Field Experiences to Support K-12 Flipped Classroom Instruction

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Abstract: This paper describes a pilot field experience component that is part of an online graduate level course in educational technology for pre-service teacher candidates. As part of the field experience, teacher candidates develop a model lecture video and learning activity screencast that are used to coach certified teachers in the methods for "flipping" their classrooms. The field experience is used by course instructors to determine the ability of their teacher candidates to plan technology-enhanced learning experiences, deepen their content knowledge, and improve their abilities to select and use developmentally appropriate technologies. Certified teachers benefit through informal coaching by pre-service teacher candidates that provides these teachers with professional development opportunities in technology integration along with the latest methods for increasing K-12 student learning and engagement in the content areas.

Introduction

Teacher accreditation organizations such as the Council for Accreditation of Educator Preparation (CAEP) (CAEP, 2016), Specialized Professional Associations (SPA) (CAEP, 2015), and state teacher certification agencies require that pre-service teacher candidates have field-based experiences prior to and as part of student teaching. Field experiences are integral to any teacher preparation program due to their ability to provide pre-service teacher candidates with opportunities to explore teaching and learning in an authentic school setting (CAEP, 2016). Practical skills, knowledge, and understandings for the teaching profession are developed by candidates as they integrate theory and practice through; classroom observations, interactions with diverse student populations, and mentoring by school professionals. During their interactions with individuals in the school, district, and community, teacher candidates must uphold professional and ethical standards, embrace diversity, and develop the dispositions required for their profession (National Council for Accreditation of Teacher Education [NCATE], 2010). Field experience components must also be aligned with educational standards and structured to support the integration of technology across the content areas for teaching and learning (VanOverbeke & Stefanick, 2014).

According to the National Research Council (2010), field experience has been identified as an important aspect of teacher preparation due to its potential for positively effecting student outcomes. Nelson (2011), emphasizes the need to provide pre-service teacher candidates with "worthwhile field-based experiences" that support their development as proficient teachers. In order for a field experience to be worthwhile, teacher candidates must have the opportunity to learn by observing the way that certified classroom teachers; plan and deliver subject area content, maintain a positive educational learning climate, assess student learning outcomes,

and conduct home-school communications. Sousa (2012, p.126) recognizes that "rehearsal is a necessary ingredient for [the] retention of learning." Thus, the ability of teacher candidates to immediately apply their new skills and understandings through practice is vital for supporting the transfer of knowledge gained through a field experience.

Designing worthwhile technology-based field experiences for teacher candidates in a 21st century learning environment can be a daunting task. Due to differences in school technology strategic plans, budget allocations, and other factors, the types of technologies adopted by a school or district typically varies. Classroom teachers are faced with rapid technology change and must continually adapt their teaching pedagogy in response to one-to-one laptop computing (Maxfield, 2016) and BYOD (bring your own device) (Raths, 2012) initiatives that are implemented in their school districts. Additionally, rapid technological changes require that both certified teachers and pre-service teachers receive continual professional development training in using classroom technologies such as online Web 2.0 applications, interactive whiteboards, laptops, tablets/iPads, smart phones, and other mobile devices.

Role of Technology Coaches

Teachers who have the support of technology coaches, are more likely to use technology as a tool within their instruction (Foltos, 2014). Technology coaches play an essential role in the digital age, global learning environment. Their primary task is to coach teachers in, model, and promote the use of technology for a variety of purposes such as; planning technology-enhanced learning experiences that are aligned with content and technology standards, selecting and using developmentally appropriate strategies and technologies to meet the learning needs and interests of a diverse student population, engaging students in local and global interdisciplinary units, developing and implementing a variety of formative and summative standards-based assessments, and analyzing student achievement data (International Society for Technology in Education [ISTE], 2011). They also serve as change agents for the implementation of technology throughout the instructional environment, develop professional development programs for teachers related to technology integration, promote student digital citizenship, and continually expand their own knowledge, skills, and expertise through personal professional development (ISTE).

It is important to note that the role of the technology coach is not to provide technical support in the form of computer or network repairs. Coaching presents teachers with a highly effective form of individualized professional development that is customized to meet their individual professional needs, personal learning styles, and content area curriculum. The coach offers teachers creative ideas, resources, and pedagogical support while allowing the teacher to serve as the primary content expert.

Flipped Classroom Approach

In traditional teacher-led lessons, content knowledge is presented during a whole group, in-class session and students are asked to complete practice activities and/or homework outside of class (Marzano & Pickering, 2007). During the lecture segment of the lesson, students are typically busy watching the teacher and taking notes. Significant points could be missed due to distraction and little time may be available to reflect upon what is being said by the teacher. A number of flipped classroom models exist that teachers currently use to change this traditional pedagogical approach for teaching and learning (Panopto, 2014). Most flipped classroom models move the lecture segment of a lesson from the classroom group learning space to an individual learning space at home (Flipped Learning Network, 2014; Panopto). A variety of learning activities can then take place during class time that include among others; the completion of individual assignments, collaborative group projects, individualized tutorial help provided by the teacher, and/or dynamic whole class discussions that are used to clarify or extend the lesson content. Through the flipped classroom approach known as the Standard Inverted Classroom Model (Panopto), students begin their lessons individually at home by viewing short video lectures or listening to audio podcasts on the Internet that are either developed by the teacher or created by others. Practice questions or

quizzes can be embedded into the videos at select points as a check for student understanding. Classroom time can then be used to practice concepts while the teacher provides students with one-to-one tutorial help.

Moving the lecture segment of a lesson from the classroom to the online learning environment benefits students in a number of ways. First, it provides students with the opportunity to replay a section of content that they don't understand or rapidly advance through content they have already mastered. Second, students who are absent from class have the opportunity to review content that they missed. Finally, parents who have the opportunity to access the video or audio lecture content are in a better position for helping their children master difficult concepts. Since students themselves decide what parts of the video or audio content to focus on and when, they take greater ownership and control of their learning (Horn, 2013). They can use their class time in a way that meets their individual learning needs.

Field Experience in Educational Technology

Background

The pilot field experience described in this section of the paper is included in a graduate-level course for pre-service teacher candidates titled *Educational Technology*. The course is part of an initial teacher certification program for elementary and secondary teacher education candidates. Since course credits can also be used towards the requirements for a Master of Arts in Teaching (MAT) degree, a small number of certified teachers can also enroll. Online course delivery is facilitated via the Blackboard Learn Course Management System (Blackboard, Inc. 2016). The course navigation bar is divided into sections that include; 1) information needed only at the beginning of the course, 2) modular lesson content and activities used throughout the course, and 3) technical support and grading information. Content scaffolding is achieved by dividing content into groups of lessons known as modules. The Field Experience Module is one of 10 groups of lessons that are incorporated into the course.

Theoretical Framework

The field experience is used by Educational Technology course instructors to determine the ability of their teacher candidates to plan technology-enhanced learning experiences for diverse student populations, deepen the candidate's own content area knowledge, and improve their abilities to select and use developmentally appropriate classroom technologies. Certified teachers benefit through informal coaching by pre-service teacher candidates that provides these teachers with professional development opportunities in technology integration along with the latest methods for increasing K-12 student learning and engagement in the content areas.

Description

Candidates gain practical experience in classroom technology integration through the completion of a 3 hour field experience. Elementary education candidates are required to interview a certified Grade 1-6 teacher while secondary education candidates must interview a certified Grade 7-12 teacher. Additionally, secondary education candidates must interview a certified teacher in the subject area which they will be certified to teach. For example, a secondary mathematics education candidate must interview a certified public school mathematics teacher. Elementary education candidates can interview a public school elementary teacher in any content area since elementary school teachers are expected to teach all subject areas across the curriculum. Candidates are not required to work directly with Grade 1-12 students and they are not assessed on their ability to do so. However, candidates may observe a classroom lesson or assist Grade 1-12 students during a lesson at their own discretion.

Instructional Design & Learning Outcomes

The instructional design of the course is based on the use of the Understanding by Design Framework (Wiggins & McTigue, 2011), a review of the literature, and best practices for technology integration identified by the authors after teaching previous sections of the course during the past 15+ years. The authors began by

determining the course learning goals, content knowledge, and technology skills. These elements were aligned with state and national standards that included the International Society for Technology in Education Standards for Coaches [ISTE Standards C] (2016), among others.

Next, assessment evidence in the form of performance tasks were determined (Wiggins, & McTighe, 2011). These performance tasks required candidates to develop a lecture video, a student learning activity screencast, and complete a culminating Field Experience Reflection Paper. The video and screencast target ISTE Standards C Elements which require technology coaches to: contribute to the shared vision for supporting a digital-age education (1a); coach, model, and implement standards-based learning experiences that integrate technology (2a); coach, model, and implement technology-based learning experiences that foster higher order thinking and mental habits of mind (2d.); and coach, model, and use online and blended learning, digital content, and collaborative learning to extend student learning and expand adult professional development (3c.). The Field Experience Reflection Paper targets ISTE Standards C Elements that require technology coaches to: model and promote digital citizenship as it relates equitable access to technology (5a.); model and promote safe, healthy, legal, and ethical uses of information and technology (5b.); and reflect on their professional practice and dispositions for the purpose of identifying their own professional development needs (6c.). Grading rubrics for the video, screencast, and paper were developed and used to measure the ability of candidates to master technological skills and to apply their learning to a new and authentic situation.

Finally, learning experiences and instruction were planned (Wiggins, & McTighe, 2011). A template for the Field Experience Reflection Paper was developed to measure the ability of candidates to transfer their learning to a new and authentic situation. The template was structured according to a series of course-embedded themes that would directly connect content knowledge to their field experience. As candidates completed a course module or segment of their field experience, they were instructed to complete a corresponding section of the paper. Course embedded themes included; Interview Information, Integration of Technology, Digital Equity, Safe, Healthy, Legal & Ethical Technology Use, Professional Development Program Evaluation, Visionary Leadership through Advocacy, and others. Following the development of the template, the themes were used as the basis for developing lesson modules. Curricular content included lecture videos and screencasts that were developed by the authors and embedded throughout the course. Supplemental learning resources were then selected, the course syllabus was developed, and the overall organization of the online learning environment was completed in Blackboard Learn (Blackboard Inc. 2016). The videos and screencasts that were included in the course provided candidates with: an introduction to online learning; described the methods for collaborative learning; introduced new technologies; and modeled the methods for using technologies in the classroom.

Conclusion & Future Directions

The potential for field experiences to have a positive effect on student learning outcomes has been identified in the literature as an important aspect of teacher preparation. Teachers who are supported by technology coaches are more likely to use technology as a tool within their instruction. Through this pilot field experience in the course titled Educational Technology, a pre-service teacher candidate and certified content area teacher form a collaborative partnership that benefits both individuals. Pre-service teacher candidates interview a certified teacher for the purpose of learning not only what types of lessons are taught in the content area, but also how technology may currently be integrated into those lessons to meet the needs of diverse student populations. In the event that technology has not been integrated into one or more of the lessons, the development of a lecture video or a student learning activity screencast by the pre-service candidate enables certified teachers to receive individualized professional development. Other benefits include the ability of Grade K-12 students to experience a flipped classroom lesson first-hand. Teachers are able to share the videos or screencasts with other teachers who teach the same grade level and/or content area. Substitute teachers can also use the video or screencast as a classroom lesson extension when the teacher is absent from school. Finally, the video or screencast content could serve as an enrichment lesson for gifted and talented students in a prior grade. They could also be used as a supplemental tutorial lesson for academically challenged students who are placed in a higher grade level. For example, videos or screencasts created for Grade 6 students could be used for students in Grades 5 or 7.

During the planning and piloting phases, we faced challenges in creating a field experience that would be worthwhile for everyone involved. A review of candidate feedback received through the course discussion board, semester-end course evaluations, and each candidate's course grading rubrics indicated that there is still some work to be done. For example, candidates who were new online learners experienced difficulty understanding why all of the field experience information and documents were contained in a single module that was presented at the start of the course. To address these concerns, the Field Experience Module will be discontinued and its content will be redistributed across the other modules. Other candidates were unable to draw inferences and make generalizations with regards to the relationship between the content, field experience, and flipped classroom. In response, lesson content will be expanded to assist candidates in the transfer of learning. Adjusted due dates will also be implemented requiring candidates to complete a section of the Field Experience Reflection Paper and submit it for grading each time they complete a module. The instructor will be able to increase feedback and address misconceptions held by the candidates as each section of the paper is graded during the semester.

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