Addressing 21st Century Teaching and Learning in a Year-Long Teacher Internship: Preparing Future Educators to Create, Implement, and Evaluate High-level Tasks to Improve Instruction

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Abstract: In the ever-changing nature of modern society, one of the challenges is to prepare students with the required literacy skills for them to be successful in their future positions and in everyday life. To do this, teachers must be prepared to teach related content with appropriate methodology. This study addresses how and to what extent does explicit goal-setting and tracking impact student achievement in a site-based, year-long elementary teacher education program. Through examining multiple sources of data, it seems evident that explicitly addressing how to: (a) set effective goals, (b) create authentic tasks that can be used as assessments to drive instruction, and (c) evaluate student progress, presents an effective way to better prepare future educators for the challenges of the 21st century classroom.

Introduction

Considering the rapid rate at which our culture is changing, it is hard to fathom the world in which elementary students of today will live and work. As our society becomes increasingly global, academic demands are becoming more complex. Many schools are not equipped to adequately prepare students for the jobs that they will fill (Gee, 2000; New London Group, 1996). To address this issue, we must prepare teachers to teach skills, strategies, and dispositions that create independent learners who can collaborate, problem-solve, and teach themselves using all the resources that are and will be available to them (Goldman, 1997; Kalantzis, Cope, & Harvey, 2003; Lankshear & Knobel, 2007; Leu, Kinzer, Coiro, & Cammack, 2004).

Teachers' knowledge and beliefs about subject matter and pedagogy are influential in planning, implementing, and assessing instruction, all of which impact student learning. Thus, our teacher preparation program must equip teacher candidates with: (a) metacognitive strategies to think holistically about why they are teaching what they are teaching, (b) effective technology-related tools and appropriate methods for developing curriculum (e.g., developing and tracking goals, instructional activities/materials, assessments, differentiation, etc.), and (c) deep conceptual knowledge about subject matter (e.g., literacy, math, social studies, science, etc.).

Literature Review

In the current era of standards-based curriculum measured by student achievement data, teacher education programs across the nation are striving to sufficiently prepare graduates to meet the challenges of such an environment (Levine, 2006). Teacher education programs have come under fire for being "theory-heavy and curriculum light" (Arrington, 2009). Especially in the area of elementary education, there has been a lack of preparation when it comes to content-specific courses. Additionally, there has been a lack of a cohesive theoretical framework related to the development of content knowledge. As Ball, Thames, and Phelps (2008) explain:

> Still, however, the field has made little progress on Shulman's initial charge: to develop a coherent theoretical framework for content knowledge for teaching. The ideas remain theoretically scattered, lacking clear definition. Because researchers tend to specialize in a single subject, much of the work has unfolded in roughly parallel but independent strands. Often it is unclear how ideas in one subject area relate to another or even whether findings within the same subject take similar or different views of teacher subject matter knowledge" (p. 394).

One explicit example is how and when technology is addressed in teacher education programs. Unfortunately, it often takes place in an isolated course, devoid of the context of a content-related field (Hargrave &

Hsu, 2000; Kay, 2006). It remains questionable whether or not the knowledge and skills learned in a single technology education course translate to a methods or field experience, let alone classroom teaching (Pope, Hare & Howard, 2002). In addition, core content is often taught in separate colleges (e.g., science, math), devoid of any educational context, and lacking a focus on how subject matter can be changed by the application of technology. The result may be a lack of conceptual knowledge on the part of teacher candidates to be able to plan and implement meaningful instruction, to set and track progress toward specific goals, and to use the latest technology-related tools to support student learning.

Over the decades, this endeavor has become increasingly important as the focus turns toward mastering 21st century skills, which include, in part, the ability to collaborate, problem-solve, and leverage available resources (Kalantzis, Cope, & Harvey, 2003; Lankshear & Knobel, 2007; Leu, Kinzer, Coiro, & Cammack, 2004). For students in K-12 classrooms to develop these abilities, they must have educators who can readily implement and model them. Thus, 21st century skills need to be addressed within teacher education programs so that pre-service teachers have the opportunity to hone them prior to having their own classrooms. The notion that sustainable school change and reform begins in colleges of education is the impetus for the current study.

The research question guiding our investigation is: How and to what extent does explicit goal-setting and tracking using 21st century tools impact student achievement in a site-based, year-long elementary teacher education program?

Description of Study in Progress

In this study, two researchers are collaborating with teacher candidates, in a reading methods course taken during a year-long student teaching experience. The course is the second reading methods class students take in the teacher preparation program. It is entitled Literacy Language 2 in the Elementary School with a focus on application of literacy strategies, including instruction and diagnostic assessment, literacy lessons with adaptations for diverse learners, and extended classroom experiences. Researchers are working with students to develop systems for goal setting and monitoring progress of student achievement. Building on the work of Au and her colleagues (Au, 2005; Raphael, Au, & Goldman, 2009), researchers are engaging teacher candidates in an iterative cycle of inquiry that includes: (a) creating rigorous short- and long-term goals for teaching and learning, (b) developing assessment systems to track students' progress over time, (c) engaging elementary students in ownership of learning and personal goal setting, (d) reflecting on effectiveness of teaching based on student data, and (e) making necessary adjustments to instruction to best meet the needs of all students.

As active participants in the study, researchers are using the gradual release of responsibility (Pearson & Gallagher, 1983) to support teacher candidates in their professional growth. They have the opportunity to: (a) learn new concepts, pedagogies, and tools and (b) practice implementing the material on an ongoing basis to increase the likelihood of theory translating into practice (John-Steiner & Mahn, 1996; Lawless & Pelligrino, 2007; Loucks-Horsley, 1995). The practice-embedded professional development plan is consistent with models that have proven most effective – those that are coherent, strategic, and aligned with schools' goals (Au, 2005; Louis, Marks, & Kruse, 1996; Newmann, Smith, Allensworth, & Bryk, 2001; Purkey & Smith, 1983; Strahan, 2003). While the study focuses on a reading methods course, we believe this model can be scaled to other methods courses across various content areas. The current study is a pilot with opportunities to reflect, revise, and plan for further implementation throughout teacher preparation programs.

Methodology

Participants in this study are students in Language Literacy 2 in the Elementary School during the Fall 2011 term, two researchers (participant observers), and the university course instructor. Students in the course (n=25 – 88% female, 12% male) are traditional undergraduates in their fourth year of college with a mean age of 22. There is one non-traditional student (41 years of age). The research team is working collaboratively with the course instructor to plan and teach the professional development intervention. Language Literacy 2 students serve as participants during the course and will continue to work with the research team for the duration of their student teaching experience.

Data Collection Procedures

Data collection began in August, 2011 and will continue through May, 2012. During summer 2011, researchers collaborated with the reading methods course instructor about embedding professional development content in the course. Beginning in August, 2011, students initially engaged in an iterative cycle of inquiry about curriculum development, assessment, instruction, and reflection. Pre-service teachers are working with elementary students in their year-long student teaching experience to create rigorous goals and to track progress toward those goals throughout the year. Researchers are collaborating with the teacher candidates for the duration of their student teaching experience to gain a deeper understanding about how they plan, assess, instruct, and lead elementary students to high levels of achievement and engagement as a result of their preparation in the Literacy Language 2 course.

Data Sources and Analyses

Data sources for this investigation include: (a) field notes, (b) videotapes, (c) interview transcripts, (d) artifacts from course work and field placement, (e) questionnaires, and (f) survey data. Both qualitative and quantitative methods are being employed for data analysis. Constant comparisons (Glaser, 1965) are being used to develop grounded theory (Strauss & Corbin, 1998) and descriptive statistics are being used to analyze survey data (Dillman, 2010). Using multiple data sources makes this study robust and enables researchers to more confidently apply findings to new contexts.

Field notes are being taken by researchers during the professional development activities embedded in the Literacy Language 2 course to capture how teacher candidates engage in inquiry about curriculum, assessment, students' needs, and data-based instructional planning. In addition to field notes, all professional development activities are being videotaped to capture content presented, questions/comments/responses from participants, and discussion among participants. Videos are being catalogued and reviewed for content analysis.

Interviews are being conducted with the course instructor and a focus group consisting of a random sample of Literacy Language 2 students to capture conceptual knowledge, pedagogical knowledge, and change over time in students' understanding of curriculum development, ongoing assessment, data-based instruction, and elementary students' engagement and achievement. Various artifacts will be collected from teacher candidates to trace their growing professional knowledge and skills over time, as well as how their teaching is impacting student achievement data. Artifacts will include curricular documents (e.g., goals, instructional plans, assessments, etc.), reflective journals, and student achievement data.

A survey was administered prior to the start of the professional development and will also be administered at the end of the professional development to measure teachers' knowledge, skills, and dispositions related to teaching and learning over time. Along with the survey, researchers administered pre- questionnaires to teacher candidates prior to professional development to gather baseline data about knowledge, strengths, and areas of need. These data were used to plan targeted professional development experiences. Post-questionnaire data will be examined to assess teacher candidate's knowledge, skills, and dispositions after engaging in the inquiry cycle about goal-setting, instruction, assessment, and student achievement.

Description of Professional Development Intervention

The following delineates the inquiry process that the Literacy Language 2 students are engaged in as part of this study of teacher preparation. Researchers are working collaboratively with students as participant observers to:

- Set long- and short-term goals for instruction in the area of 21st Century literacy. The goals are broad, measureable, and based on end-of-year outcomes. This enables teacher candidates to conceptualize curriculum, instruction, and assessment as a holistic system.
- Develop end-of year goals, focusing on how to collect data that demonstrates student growth toward those goals. Additionally, researchers support teacher candidates in determining what constitutes data, how to assess prior to, during, and after instruction, how to adjust instruction based on results, and how to gauge effectiveness of teaching as reflected in student data.

- Create an assessment system for monitoring progress over time. Researchers are engaging teacher candidates in inquiry that requires them to think about what a student should be able to do and what a product might look like when students have mastered the end-of-year goals.
- Develop and administer three parallel assessments, all based on end-of-year outcomes.
- Analyze data systematically and plan instruction accordingly.
- Make instructional goals transparent to their students and engage them in personal goal-setting about their own needs.

This inquiry cycle encompasses all aspects of teaching and learning embedded within a specific content area, in this case literacy. It is teaching teacher candidates a way of thinking conceptually that will be transferable to all other curricular areas.

Preliminary Findings

Survey of knowledge about literacy and technology
To determine an initial perception of skill sets concerning literacy and technology, a web-based survey was administered. Items were constructed and modified from existing instruments in the literature (Archambault & Crippen, 2009). Items related to various concepts within literacy education as well as the constructs related to content knowledge (CK), pedagogical knowledge (PK), technological knowledge (TK), and the combinations of these areas that form the technological pedagogical content knowledge (TPACK) framework were administered. Figures 1 and 2 display students' perceptions of their skills in various areas on a scale of 1(Poor), 2 (Fair), 3(Good), 4 (Very Good), to 5 (Excellent).
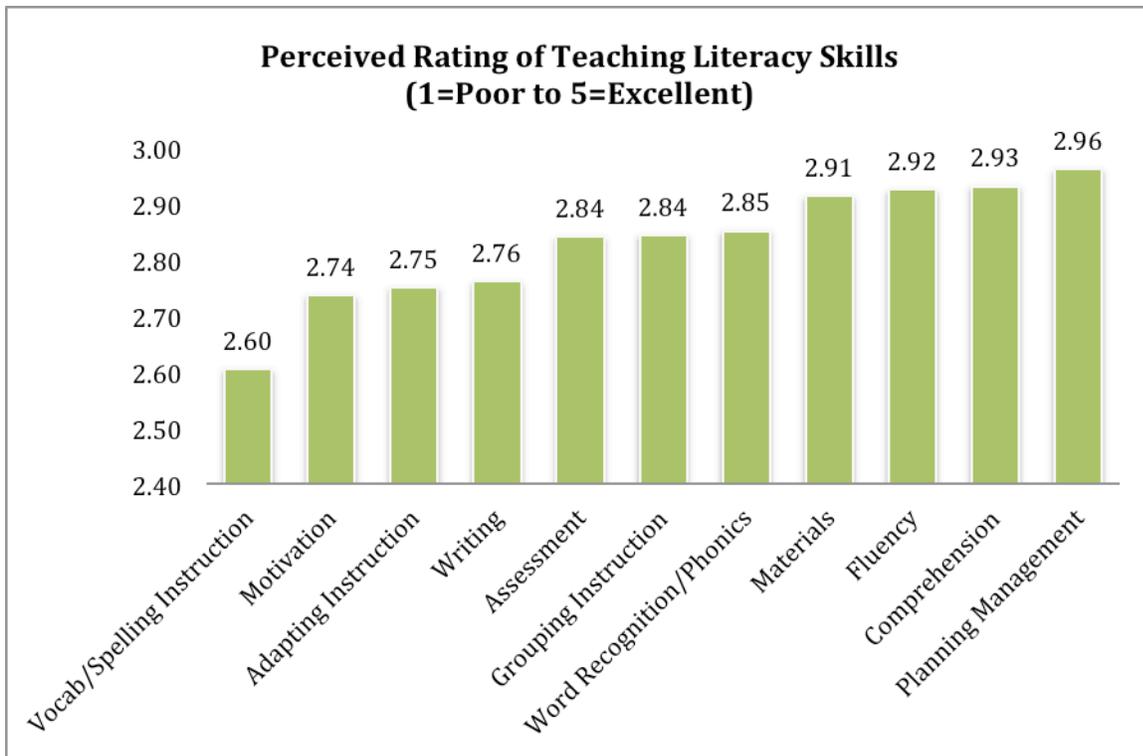

Figure 1: Perceived Rating of Teaching Literacy Skills

Initial findings reveal that pre-service teachers perceive their skills are low with relationship to content knowledge, and pedagogical knowledge, in addition to vocabulary/spelling instruction, motivating students, and be able to adapt instruction. In particular, the lowest item associated with literacy skills was "Creating a scope and sequence for writing curriculum (2.21), followed closely by "Creating a score and sequence for reading curriculum" (2.25). Interestingly, a similar item related to content knowledge, "My ability to decide on the scope of concepts taught

within my class" (2.46). The struggle of pre-service teachers to determine what is to be taught, the skills necessary to teach the content, and deciding the order in which to structure instruction was notable as this is the focus of the professional development intervention.
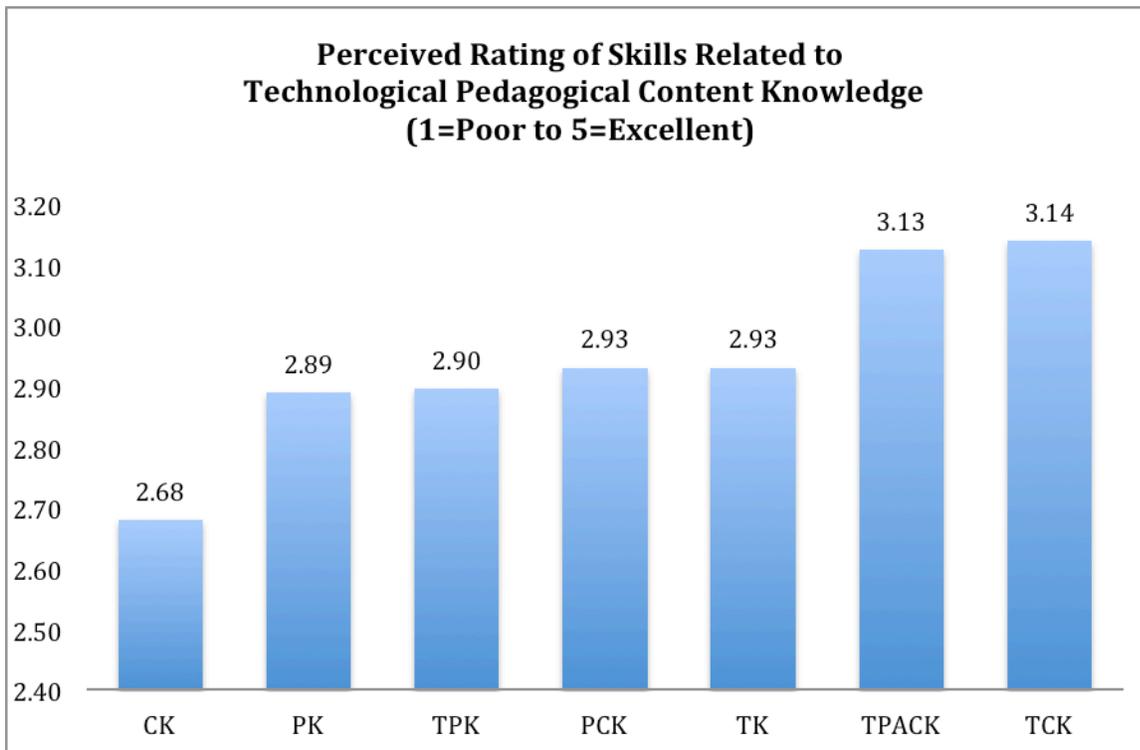
Perceived Rating of Skills Related to Technological Pedagogical Content Knowledge (1=Poor to 5=Excellent)

Figure 2: Perceived Rating of Perceived Rating of Skills Related to Technological Pedagogical Content Knowledge

Baseline questionnaire on 21st century teaching and learning

Initial findings from the baseline questionnaire suggest teacher candidates have limited or no experience planning for instruction. The experiences they do have are primarily from observing mentor teachers plan for instruction using state standards and/or a pre-determined scope and sequence from packaged curricular program (e.g., basal reading programs). Teacher candidates demonstrate little or no thoughtful decision-making about what they will teach or how they will teach it. Most participants reported using state curricular standards as year-end goals for student learning, rather than developing broad goals that the standards will lead to. Noteworthy is the language teacher candidates are using in reference to implementing instruction (e.g., presenting or performing lessons). In the few instances that teacher candidates reported having experiences teaching students, they mentioned components of lesson plans (e.g., check for understanding, modeling, guided instruction) or affective responses (e.g., feel nervous, not confident, like it). None of the candidates articulated how to plan, implement, or assess effective instruction – either as pieces in isolation or as a holistic integrated system.

Video and audiotapes of professional development

Initial findings suggest teacher candidates have little or no familiarity with goal-setting or using standards to frame instruction. They are primarily relying on basal programs and teaching skills in isolation. Analysis of conversations from the first intervention session surfaced teacher candidates' conceptions of curriculum and instruction. Comments during discussion focused on barriers that would impede their ability to approach curriculum in the way being presented in the intervention, which contrasted what they were observing in their mentor teachers' classrooms. Participants expressed feeling overwhelmed and confused about what they were learning compared to what their mentors were doing. This created cognitive dissonance for the teacher candidates, which contributed to a slight shift in conversation during the second intervention session. During the second session, teacher candidates began creating assessment tasks, which made the theory from the initial intervention session more tangible for them.

Conversation began to change from resistance to inquiry about how to implement the new material in their internship classrooms. Questions and comments also indicate that teacher candidates are beginning to think about how to apply what they are learning in their own classrooms, not simply focusing on the student teaching experience. This may suggest initial shifts in identities from student to professional.

Field notes from intervention

Field note observations revealed that while teacher candidates had extensive visions for the ultimate goal of what they wanted for their students to be able to do as a result of their education (e.g., work collaboratively, build independence, take responsibility), the future teachers lacked the necessary knowledge to translate this into discernable skills to be taught, what literacy skills might be involved, or how to set a goal that addresses this area while encompassing common core and/or state standards. This finding was confirmed by questionnaire responses indicating that participating pre-service teachers lacked pedagogical content knowledge surrounding standards-based instruction, how to develop realistic and effective goals, and how to measure progress toward set goals.

Noting these needs, the professional development intervention was designed to address these areas, most notably, how to set goals for instruction in the area of 21st century literacy, how to assess student progress toward meeting the goals, and how to drive instruction based on resulting data. As part of learning these skills, pre-service teachers will be guided through the process by developing and implementing their own authentic tasks in their student teaching. Because the intervention is situated within the context of a required literacy course, teacher candidates were initially concerned about how the related activities might impact their grade in the class. In addition, they expressed many logistical concerns including how they were going to fit the activities into their already busy schedule as well as how they might be able to incorporate such a task and related instruction within the confines of being a guest in their mentor teacher's classroom. Teacher candidates also expressed fear concerning how this instruction would map to the state standardized test.

During the first visit, in which goals and common core standards were addressed, overall engagement was high during instruction related to common core standards. However, when discussing how to write meaningful goals that are specific, measureable, attainable, realistic and rigorous, and time-specific, engagement dropped. This could be partly due to lack of background knowledge and necessary skills to be able to construct such goals.

In subsequent sessions, field notes showed a visible shift in teacher candidates' conversation and dialogue surrounding teaching low-level skill sets for the sole purpose of preparing for standardized testing. Their thinking moved to include a broader understanding of the value of meaningful instruction beyond the confines of the classroom. During the second visit, teacher candidates created curricular materials that mapped to common core state standards (www.corestandards.org) and could be used to assess student learning and make meaningful instructional decisions. The creation of these tasks made the purpose of the professional development instruction more concrete and understandable for the teacher candidates. Subsequently, researchers noted signs of an initial shift in identity from a role as a student to that of an educational professional with ownership of specific goals and curriculum.

Implications and Conclusion

Teacher education programs are responsible for preparing teacher candidates with the skills necessary to apply conceptual knowledge about subject matter, consider what they should be teaching and why, and know how to use technology-related tools and appropriate methods to improve instruction. This has become increasingly difficult due to the challenge of effectively addressing 21st century learning skills during the era of high stakes standardized testing. Initial findings from the current ongoing study suggest future educators display the most need with regard to issues of content and knowing how to plan, design, implement, and evaluate classroom instruction. Too often these skills are taught in isolation, without the ability to implement them in an actual classroom setting, along with a lack of time to set and work toward a long-term instructional goal.

As a result of the professional development invention described in this study, which represents an ongoing effort to work with teacher educators during a year long student teaching internship, the intent is for future teachers to be better equipped to plan and develop meaningful, goal-driven instruction. The described data sources will continue to be examined for relevant themes and to measure the progress of teacher candidates throughout the duration of the project. Thus far, explicitly addressing how to set effective goals, create authentic tasks that can be used as assessments to drive instruction, and evaluate student progress presents an effective way to prepare future educators for the challenges of the 21st century classroom.

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