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From NCATE to CAEP: Sixty Years of Trends and Changes

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Abstract

The following case study explored continuing trends and changes that have occurred over the past sixty years of accreditation pursuits by one Education Program Provider (EPP) in Arkansas. The researcher conducted content analysis of three previously submitted National Council for the Accreditation of Teacher Education accreditation reports and present information and data considered for the upcoming Council for the Accreditation of Educator Preparation accreditation report. Findings of the study included identification of continuing trends involving persistent teacher shortage areas, EPP application requirements, and the central focus of field experiences in teacher preparation. In addition, findings included changes in the role of the EPP based upon accrediting agency evolution of purpose and scope, amplified program accountability, and increased digitalization impact and opportunities.

Introduction

In today's environment in which Education Program Providers (EPPs) operate, it is beneficial to consider how EPPs have evolved within the continuously changing and more challenging accreditation landscape. Eaker and Sells (2016) note correctly, "In short, the same waves of accountability measures aimed at K-12 public schools beginning with the No Child Left Behind legislation now lap at the shores of U.S. public institutions of higher education" (p.11). Such change has been particularly evident in colleges of education and is clearly denoted in present accreditation expectations.

In fact, across the past sixty years, accreditation expectations have evolved dramatically as the National Council for Accreditation of Teacher Education (NCATE) has transitioned into the Council for the Accreditation of Educator Preparation (CAEP). Within this evolution, the educator preparation accreditation agency has increased its expectations for education program providers, extended the scope of its accreditation standards, and greatly expanded the data requirements supplied as evidence of educator preparation program impact. In this environment, it is beneficial to consider how EPPs have responded to these increasingly broad-reaching accreditation expectations and to examine trends and changes noted within and/or initiated partly as a result of these accreditation expectations.

Statement of the Problem

Therefore, the purpose of this case study was to examine how one EPP has transitioned its data collection approaches, how the EPP reported its data, and how its results have changed over the past sixty years. Four accreditation reports (three previously submitted and one being prepared) were analyzed and compared to determine what trends persist in teacher education within this EPP and what changes have occurred as new accreditation standards and expectations have been implemented. The case study was limited to initial licensure preparation and does not include advanced licensure preparation.

Review of Related Literature

The National Council for Accreditation of Teacher Education (NCATE) began in 1954 as an accrediting body (CAEP, 2018a). This accrediting body's original goals included the recognition of teaching as a major profession, in part, through examination of institutional capacity for developing teachers, and to effect public opinion in support of the professionalization of teaching (Council of Chief State School Officers [CCSSO], 1969a). From its initiation, the CCSSO noted that NCATE involved a host of shareholders. These shareholders included state education agencies, the American Association of Colleges for Teacher Education (AACTE), the National Council of Chief State School Officers, the National School Boards Association, the National Association of State Directors of Teacher Education, the National Commission on Teacher Education and Professional Standards, practitioners, and teacher-education institution members.

NCATE worked with these various constituents to develop a set of licensure standards for the teaching profession that institutions could pursue in order to be accredited as a preparer of teachers. Institutions were then required to file accreditation reports along with any supporting documentation to demonstrate attainment of these initial standards. According to the Arkansas Polytechnic College (1961) report, these standards included the following:

Standard I – Objectives of Teacher Education
Standard II – Organization and Administration of Teacher Education
Standard III – Student Personnel Programs & Services for Teacher Education
Standard IV – Faculty for Professional Education
Standard V – Curricula for Teacher Education
Standard VI – Professional Laboratory Experiences
Standard VII – Facilities and Instructional Materials for Teacher Education (p. 3)

As noted by the CCSSO (1969b), NCATE accreditation pursuits rapidly increased from 1955 (284 accredited institutions) to 1967 (449 accredited institutions). The CCSSO also reported during this time that the increase; however, was not without controversy as certain institutions challenged NCATE structure, standards, and processes. In spite of these challenges and revisions, NCATE-accredited institutions produced approximately 74% of the new teacher professional workforce. Arkansas joined this movement in its early stages and contributed to these increased numbers of accredited institutions and teacher education graduates.

Over the next twenty years after its inception, NCATE began the process of examining and revising its accreditation standards and streamlining its processes (AACTE, 1970; Newman, 1976). With NCATE encouragement and support, the AACTE developed new standards for basic teacher education programs ***and*** advanced programs. NCATE adapted and adopted these proposed standards for accreditation. These standards for basic teacher education programs included expectations for governance, curricula, faculty, students, resources and facilities, and evaluation, program review, and planning.

Although these standards resulted in greater challenges and requirements for depth and specificity for institutions, few, if any, institutions were fully prepared for the next initiation of outcomes-based standards. Elliot (1997) foreshadowed this upcoming paradigm shift when he stated,

> Can we be bold enough to imagine some elements of a new way of assessing program quality that would depend less on evaluation of courses offered and more on evaluation of performances of candidates and institutions? (p. 41)

Darling-Hammond, Wei, and Johnson (2009) concurred with these conclusions of Elliot and noted the drivers that moved standards in this particular direction including the increased focus and scrutiny of state agencies, legislative bodies, public entities, and new standards development by the Interstate Teacher Assessment Consortium and National Board for Professional Teaching. The authors also noted the effect of these changes on the teacher preparation landscape resulting in more extensive assessment measures, careful consideration of preparation approaches, and deliberate reflections upon and changes made due to data findings.

NCATE followed these developments and demands to develop a set of six new performance-based standards (NCATE, 2002). These six standards included the following:

Standard 1 – Candidate Knowledge, Skills, and Dispositions
Standard 2 – Program Assessment and Unit Capacity
Standard 3 – Field Experiences and Clinical Practice
Standard 4 – Diversity
Standard 5 – Faculty Qualifications, Performance, and Development
Standard 6 – Unit Governance and Resources (p. 48)

With these new standards, units (colleges of education) needed to collect, collate, analyze, and present performance and outcomes-based data (e.g., portfolios and portfolio results, course artifacts and course artifact results, pass-rates on licensure examinations, diversity composition changes over time, etc.).

Elliot (2003) succinctly summarized this now recognized paradigm shift in accreditation expectations when stating the following:

> NCATE formally launched its new performance-based accreditation system in September 2001. That system shifted the emphasis in accreditation from what the institution offers its candidates to what the candidates receive. Institutions must now provide evidence that candidates have the knowledge and skills necessary to teach, the dispositions to teach, and the ability to put these attributes into action so that all students will learn. (p. v)

With this paradigm shift, the function and process of accreditation placed an increased onus upon performance and outcomes-based data collection, analysis of these data, and clear demonstrations of continuous improvement efforts. In order to achieve these standards, institutions implemented changes in systematic data collection approaches, opportunities to carefully examine data produced, and recording of significant changes that occurred based upon the data collected and analyzed. NCATE (2002) summarized its expectations in its 170+ page *Handbook for Accreditation Visits*. As opposed to previous accreditation (re-accreditation) efforts, during this time, NCATE required institutions to begin a transition from hard copy data collection (with on-site filing cabinets) to digital data collection, which allowed institutions the opportunity to report significantly greater amounts of data, summarizations, and revisions (This change provided the pathway for the future CAEP Accreditation Information Management System [AIMS]).

These changes in the 2002 iteration of the NCATE standards served as a precursor for an even greater paradigm shift following NCATE's merger with fellow accreditation agency TEAC (Teacher Education Accreditation Council) that had begun in 1997 as an alternative to NCATE accreditation. With the merger of these two accreditation agencies in 2010, the new agency known as CAEP proposed standards for review and acceptance. CAEP began operation with these new accreditation standards in 2013 (CAEP, 2018a).

CAEP's (2018b) new initial licensure standards included the following:

Standard 1: Content and Pedagogical Knowledge
Standard 2: Clinical Partnerships and Practice
Standard 3: Candidate Quality, Recruitment, and Selectivity
Standard 4: Program Impact
Standard 5: Provider Quality, Continuous Improvement, and Capacity

Within these five standards, CAEP included 23 components. Of which, CAEP included seven that are "required components" for accreditation. In other words, if these seven are not met, accreditation cannot be granted. As opposed to previous iterations, CAEP standards now include advanced program standards that also broaden the scope of EPP responsibility. Although not a focus of the present study, it should be noted that CAEP's (2018c) advanced program standards mirror its initial licensure standards.

In line with NCATE's previous work, CAEP designed these standards as performance and outcomes-based benchmarks. With these novel standards, CAEP required institutions to provide a more significant degree of data, data analysis, and reporting of major revisions based upon these data across its programs, processes, structures, and efforts. In addition, CAEP's new standards required Education Program Providers (EPPs, formerly "units") to demonstrate impact on student learning *after* program completion in the first three years of employment, detailed reliability and validity considerations of data collection instrument use, yearly reporting of standards attainment and revisions, and careful implementation and consideration of candidate quality, recruitment, and selectivity. With these added elements, CAEP provided a plethora of handbooks, guides, conferences, presentation summaries, articles, weekly email communications, and other tools to help EPPs better understand and reach expectations denoted in the CAEP standards.

As indicated in the aforementioned, changes in accreditation requirements have placed an increased onus on EPPs including the EPP considered within this study. Based upon these developments, the researcher explored the following research question to provide insight into trends and/or changes that have occurred in the EPP within its approximately sixty-year pursuit of accreditation and continuing accreditation.

Research Question

What continuing trends and/or changes have occurred within one Arkansas EPP during four points in time across sixty years of accreditation pursuits as indicated by content analysis of three submitted accreditation reports and one report being presently prepared?

Method

Participants

A number of individuals produced the data in the accreditation reports examined within this public university located in West-Central Arkansas. Over this sixty-year time period, the university grew in student population from 1351 students in 1961 to just over 12,000 students in 2018 with the most expansive growth occurring over the last twenty years (Arkansas Tech University Institutional Research, 2018). The university reported limited demographic information in 1961. In the late 1970s and early 1980s, the university reported ethnic compositions consisting predominantly of Caucasian students (92.8% to 94.2%) with the remaining underrepresented population being almost entirely African American (5.2% to 3.8% respectively). From the early 2000's to the present, Caucasian enrollment percentages have

remained in the mid to low 80% range with underrepresented populations, particularly African American and Hispanic American populations, steadily increasing.

In 1961, the number of education instructors and professors included seven individuals. Due to changes over time in the university and programs, in 1981, the number of individuals preparing teachers included 43 individuals. With the addition of advanced licensure programs and additional initial licensure programs, the number of faculty involved with teacher education and other school personnel preparation now well exceeds these previous numbers with nearly thirty full-time faculty devoted entirely to education preparation, approximately twenty devoted to content methods instruction in other colleges, and a host of education adjuncts and part-time instructors.

Data Collection Methods and Analysis

The approach used in this study was a case study approach following Yin (2018). The case study involved the institution (including its accreditation artifacts) at four different points in time across a sixty-year time period. The case study was pursued to provide insight into the EPP's accreditation during these time periods and to identify the continuing trends and changes during these four points within this sixty-year time period. In effect, the case study provides insights into four different versions of the EPP affected by accreditation expectations at these four windows of time.

Specifically, this involved exploration of three EPP archived accreditation reports spanning an approximately sixty-year period. The accreditation reports included submissions from 1961 (Arkansas Polytechnic College), 1981 (Arkansas Tech University), and 2005 (Arkansas Tech University). In addition, the EPP is presently preparing its EPP accreditation report for 2020. In the present study, the researcher conducted content analysis using these four accreditation reports as the unit of analysis. The researcher examined persistent trends and changes in the data and information as delineated in these accreditation reports.

Results and Discussion

Results of the analysis are arranged in this section by the categories of *Continuing Trends across the EPP Reports* and *Changes across the EPP Reports*. Within each category, several themes emerged. Each of these is reported within the category section.

Continuing Trends across the EPP Reports

Persistence of Teacher Shortage Areas. One of the persistent trends noted in these data is the continued shortage of science, foreign language (Spanish), mathematics, and speech teachers produced by the EPP. As the United States Department of Education (USDE) (2017) has noted, this teacher-shortage area trend has been persistent in Arkansas for the last twenty years. The results of this present study, as related to this EPP, support the USDE's findings. In fact, from its first report in 1961, the EPP data exemplified its struggle to attract students interested in chemistry education, physics education, and speech education with a total of six full-time majors in 1961 with no graduates in these fields in 1960 or 1961.

In the 1981 report, enrollment numbers indicated a continuing trend in the areas of science and speech. Program completers in all physical science education areas (i.e., chemistry, physical science, and physics) included three individuals in 1977-1978, seven individuals in

1978-1979, and three individuals in 1979-1980. Speech education program completers demonstrated similar numbers at this time with three, two, and zero students respectively. Mathematics education completers included six, seven, and six students during this same time. The EPP did not report foreign language education enrollment during this span.

In the 2005 report, enrollment trends continued to show this pattern. Within a four-year period from 2000-2004, one student achieved licensure in the physical science area. Mathematics remained steady but low with nine individuals completing the program over the same four-year period. The EPP did not report any speech education graduates during this same period. In addition, Spanish Education program completers included ten individuals during this span.

In preparation for the CAEP Accreditation visit in 2020, the EPP examined current data on program completion and found a similar pattern. Chemistry education, mathematics education, physics education, Spanish education, and speech education continue to show similar trends with program completion being nearly identical to the 2005 accreditation report data.

In opposition to these shortage area data, the EPP reported consistently high levels of enrollment for elementary education/early childhood education and health and physical education. These two areas remained as two of the largest enrollment and program completer areas within the 1961 accreditation report through the 2020 accreditation report data.

Stage II Application Requirements. A second theme that arose across the four accreditation reports was the use of Stage II Application requirements of testing, grade point average (GPA), and advisor recommendation for entrance into education preparation programs. In 1961, the EPP made use of the ACE Psychological Test, 1952 edition, to assess candidates' grammar, spelling, and punctuation abilities. The EPP also used the Davis Test of Functional Competence in Mathematics to assess mathematics ability. During this time, the EPP was an active member of the Arkansas State-Wide Testing Program involving colleges and public schools seeking to administer a common test to all Arkansas high school students for use at various colleges across the state.

The EPP also used GPA as an entrance factor in 1961. The EPP GPA requirement for entrance into Stage II of the program was set at a minimum of 1.75 on a 6.00 scale. The EPP provided these data in table form for the Internship Application (requiring a 2.00 GPA on a 6.00 scale) in its 1961 report. Scores of internship applicants ranged from 1.57 to 5.53. The final requirement for Stage II application included a recommendation from the advisor and ultimately a recommendation from the Dean of Women or Dean of Men at the college. The advisor served as both a mentor and recommender based upon performance of the candidate and dispositions exhibited.

These three requirements formed the basis of the future requirements for Stage II application within the EPP. In the 1981 report, the EPP ceased using an entrance test (This would be a temporary action.). The EPP established a cut score of 2.00 on a 4.00 scale (rather than the 6.00 scale used in 1961). In addition, the EPP continued to require advisor approval for the Stage II application. After an advisor recommendation and GPA report, the Teacher Education Committee then met to consider these aspects and other "factors which reflect professional competence, including emotional and moral stability, physical and mental health, intellectual alertness, use of English, social awareness, and professional interest" (Arkansas Tech University, 1981, p. 2-44).

Stage II test requirements returned in 2005. Prior to the 2005 accreditation report, the Arkansas Department of Education had established cut scores for a common assessment within

Arkansas – the Praxis I. In 2005, the EPP used this assessment to measure what three previous tests had been used to assess in 1961 for entrance into Stage II. This trend continued into the 2020 accreditation report preparation. The significant change that occurred between the 2005 report and the 2020 report involved the replacement of the Praxis Core Academic Skills Test (which previously replaced the Praxis Pre-Professional Skills Test) with the American College Testing assessment. This change occurred in the last two years based on new CAEP accreditation standards and Arkansas Department of Education teacher licensure revisions.

In 2005, the EPP continued to report GPA for its candidates at Stage II within its accreditation report and set a 2.50 GPA requirement. Shortly after the 2005 EPP accreditation report was completed and a new set of CAEP accreditation standards were established, the EPP transitioned to the requirement of a 2.70 GPA requirement to meet the CAEP cohort GPA average requirement of 3.00. It is of note that in spite of the changes from the 1961 report in GPA requirements (1.75 on a 6.00-point scale) to the 2020 report in GPA requirements (2.70 on a 4.00-point scale) that the EPP continues to value GPA as a major entry-point requirement in teacher preparation.

In 2005 and 2020, the EPP used one additional entry requirement that stayed consistent from 1961 through 1981 and into the present. This additional entry requirement was a recommendation by a faculty advisor who indicated the academic and dispositional evidence of the candidate. In the earliest report, this supervisor not only recommended the candidate for program participation but also served such additional roles as approving the candidate's living quarters during the internship experience. For this sixty-year period, advisors have continued to serve in a recommending role as related to teacher education candidates at Stage II and Internship entrance.

Program and Course Preparation with Field Experiences. A final theme that arose from these data includes program and course preparation with field experiences. In the 1961 report, it was apparent the EPP expected candidates to be well prepared in the liberal arts/general education areas and to be well prepared in their education course preparation. The EPP considered this generalized and specialized training to be essential and noted this in the accreditation report. The EPP also recognized the importance of field experiences within this coursework in their accreditation pursuits. The 1961 accreditation report delineated field experiences as an important part of the human development course and the student internship experience. In the human development course, teacher education candidates spent two hours per day for nine weeks observing a child in the public school setting. In the student teaching internship experience, candidates spent nine weeks in the field with candidates at times having the opportunity to teach "for sometimes as long as a week" (Arkansas Polytechnic College, 1961, p. 54). Elementary education candidates participated in additional hours of observation and field experience work through reading to children in libraries, observing and analyzing learning episodes in the classroom, and through a set of specific observations.

In the 1981 accreditation report, this theme involving program and course preparation with field experience requirements was also recognized. The EPP reported an increase in the number of professional education hours required of candidates, particularly in the elementary education program (Grades 1-6). In addition, the report noted that elementary education candidates could add endorsements in Kindergarten-6, Elementary Physical Education, Reading, Middle School, Librarian K-12, or Media Specialist K-12 by completing additional coursework. Within the 1981 report, field experiences continued to play an increasingly important role in

teacher preparation with additional courses requiring a field component. During this time, the EPP increased partnerships with public schools and local Head Start programs to provide additional field experiences. The EPP notes in its 1981 accreditation report that "laboratory and clinical experiences designed to provide a practical application of the theories of teaching and learning are provided for programs at all levels" (Arkansas Tech University, 1981, p. 2-24). In this field experience emphasis, the student internship experience actually decreased to six weeks. However, the university worked with public school partners to provide candidates with more specified and extended teaching experiences during this time.

By 2005, course and program preparation increased in scope, breadth, and depth. The EPP carefully connected major course artifacts to field experiences within the courses in which these artifacts were to be completed. To ensure effective measurement of these artifact data, the EPP designed detailed rubrics used in the assessment of candidates' knowledge, skills, and dispositions particularly as exhibited within the field experiences completed. According to the accreditation report (Arkansas Tech University, 2005), "Arkansas Tech's professional education programs at the initial level include a vast array of field experiences that serve as authentic learning opportunities for candidates to integrate theory with practice" (p.49). Performance and outcomes-based evidence requirements demanded increased field experiences, more detailed internship experiences, and strong evidence of candidates' positive impact on student learning. The EPP noted increased hours of student internship experiences from nine weeks in 1961 to fifteen weeks in most programs in 2005. Field experience and internship hours ranged from 647 to 693 hours across programs during this time.

The EPP has continued to emphasize program and course preparation with field experiences in its preparation for the CAEP 2020 accreditation visit. In fact, nearly all preparation courses require a substantial field experience with a major course artifact(s) aligned to this experience. As related to the student teaching internship experience, all programs now require candidates to be in the field for 15 weeks. In addition, the EPP has initiated a new yearlong internship experience to assist in meeting CAEP standards for initial licensure programs and public school personnel expectations further increasing the field experience hours well beyond what was cited in the 2005 report.

Changes across the EPP Reports

The Teacher Accountability Emphasis. One theme that arose from analysis of the four EPP accreditation reports across the past sixty years is that of the teacher accountability emphasis. In the 1961 accreditation report, the EPP noted efforts primarily "in-house" to ensure candidates were prepared to enter the teaching profession. The EPP listed expectations of candidate behavior, approved or disapproved housing arrangements during the internship experience, pursued feedback from supervising teachers during internship, sought information from graduates, and worked as faculty advisors to ensure strong success, dispositions, and preparation of candidates. The EPP then reported these efforts to NCATE as the external accrediting agency. The EPP broadened and noted these continuing efforts within the 1981 accreditation report.

The teacher accountability emphasis began to change dramatically in the late 1980s and early 1990s. The shift was likely due to multiple educational, political, and broader societal factors and expectations (e.g., see Carter, 2008). To discuss in detail the broader factors effecting

these changes in teacher accountability is beyond the scope of the current study. However, it should be noted that the EPP and the broader education community responded during this period to encourage much greater teacher accountability.

The 2005 and subsequent EPP accreditation reports delineated some of the changes spurred on by the newly emphasized teacher accountability emphasis. For example, in 2005, the EPP reported pass-rates for multitudinous Praxis Subject-Area and Principles of Learning and Teaching examinations that were designed to assess the depth of preparation of teacher education candidates and to demonstrate this preparation to a variety of audiences. Although teacher testing had been present for some time prior to this, these new exams were well beyond what had been traditionally used to assess teacher candidate preparation.

In addition to these more in-depth testing requirements, the teacher accountability efforts led to the design of new performance-based assessments implemented to assess graduates in their first year of practice. The 2005 EPP accreditation report noted this new Arkansas *Pathwise* requirement in its reporting. This new assessment system required the EPP to prepare candidates for the teaching profession *and* for this new teacher accountability measure.

The Arkansas Department of Education (ADE) (2018) ceased using the Pathwise system and replaced it with the Teacher Excellence Support System (TESS) in 2013-2014. This revision moved assessment from solely involving first year teachers (in Pathwise) to all teachers (in TESS) and emphasized professional development and growth in the process. In the most recent EPP accreditation report currently being prepared for the 2020 visit, the EPP has noted alignment to the TESS Domains and Criteria throughout its documentation to provide evidence to various shareholders that candidates are well prepared for the teaching profession.

Each of these measures exist to ensure teacher accountability and to protect students. Rather than ceasing some accountability measures and initiating others, with new accreditation standards and expectations, EPPs including the one involved in the present study, have simply added new layers of teacher candidate accountability to what existed as far back as 1961. More specifically, the "in-house" measures used in 1961-1981 are still being used with the added measures of extensive background checks, more thorough assessment efforts, disposition analysis, ADE training modules, ethics training, and TESS emphasis among other efforts. Such extensive teacher accountability measures did not exist in the first half of this sixty-year period. In addition to "in-house" measures, the EPP now reports a plethora of external teacher accountability data for its candidates.

Program Impact. A second theme gleaned from the four EPP accreditation reports involves the changing role of the EPP based on the accreditation standards over this sixty-year period toward demonstrating program impact on teacher education candidates and P-12 learners. The EPP accreditation reports clearly signify the shift in focus over these sixty years. Whereas the EPP's emphasis was initially almost entirely focused on its inputs with some small emphasis on the outcomes, the EPP's current focus appears to be primarily on its outcomes with some of its attention being given to its inputs. As noted previously, NCATE expressed its original purpose in its initial proposal with two main goals. NCATE's first goal involved recognition of teaching as a major profession with its second involving the surety that institutions had adequate resources (e.g., faculty, programs, facilities, etc.) to confirm the effective preparation of future teachers (CCSSO, 1969a). The EPP's early NCATE accreditation reports clearly indicate pursuit of these two goals. Within the first accreditation report, the EPP denoted evidence of faculty qualifications, resources availability, facilities, and programs offered. In the 1981 report, the EPP

broadened its discussion in a considerably longer report and carefully outlined its governance, curricula, faculty, student population, resources and facilities, and its evaluation, program review, and planning. In this report, the EPP also carefully detailed each program offered and how the EPP was ensuring the effective implementation of these respective programs. In addition, the EPP did gather some outcomes-based data within both the 1961 and 1981 accreditation reports in the form of feedback from students, supervisors, and public school personnel. However, the EPPs reports in 1961 and 1981 almost exclusively emphasized the inputs to educator preparation.

With the 2005 accreditation report, a notable change was evident. The new NCATE standards clearly communicated a shifting landscape in accreditation. The NCATE (2002) *Handbook for Accreditation Visits* captured this succinctly in stating,

> In NCATE's performance-based system, accreditation is based on evidence that demonstrates that teacher candidates know the subject matter and can teach it effectively so that students learn. In the NCATE system, units must prove that candidates can connect theory to practice and be effective in an actual P-12 classroom. (p. 1)

It is important to note the last line of the previous quote, which states, "…units must prove…" With this new burden of proof, accreditation shifted from an input model to an outcomes and performance-based model replete with new standards containing thirty-two elements.

The 2005 EPP accreditation report demonstrates this changing emphasis concerning program impact. In its list of Standard 1 exhibits (in digital format), the EPP included approximately 90 separate files to "prove" attainment of Standard 1. Many of these files included substantial numbers of artifacts, assessments, data summaries, and reflections. Standard 2 contained approximately 150 files to "prove" attainment. Within subsequent files for these new performance-based standards, the EPP included links to trainings, employer information, placement locations, minutes and agendas of various meetings, university budgetary notes, faculty qualifications, efforts concerning the establishment of reliability and validity regarding measurement decisions, school-visit interview information, and changes implemented by the unit among other pieces of information. A quote from the Arkansas Tech University (2005) accreditation report summarizes the unit's efforts to provide ample performance-based data. The EPP report notes,

> Multiple evaluative sources are used when assessing candidate's professional commitments and dispositions. This on-going and comprehensive examination involves professors, field-based mentors/supervisors, outside assessors, and employers. (p. 13)

In preparation for the 2020 visit and in preparing the accreditation report, the EPP recognizes the continuation of the performance-based accreditation process. However, the EPP also recognizes substantial additions pertaining to its accreditation pursuits. For example, whereas the 2005 standards involved a relatively small burden of proof of impact upon P-12 learners after employment (i.e., employer follow-up data, *Pathwise* data, etc.), the new standards include a more substantive burden. This burden involves teacher graduate impact data on P-12 learning, indicators of teacher effectiveness, follow-up of graduates, and follow-up of employers *for the first three years* of employment (CAEP Standard 4).

The EPP clearly recognizes the difficulties of meeting this new standard as an EPP within the State of Arkansas. In preparation for its 2020 visit and the required accreditation report, the EPP has initiated multiple efforts in an attempt to ascertain P-12 learning impact data and indicators of teaching effectiveness. After initiating conversations and efforts with state agencies,

local school districts, other EPP providers, program participants and various university and public school partners; the EPP further realizes the difficulties in meeting these particular components of Standard 4.

Another major change involving program impact pertains to the roles of diversity and technology within the 2013 standards. Whereas diversity served as its own standard in the 2005 report, diversity and technology should now be examined across all five standards delineated by CAEP. This new addition requires EPPs to examine candidate's knowledge, skills, and dispositions; the EPP's field experiences, the EPP's recruitment, diversity, and selectivity expectations and efforts; the graduate's impact on P-12 learners after graduation, and the EPP's efforts at continuous improvement *through the lenses of diversity and technology*.

Moreover, in comparison to the 1961, 1981, and 2005 accreditation reports, the 2020 accreditation report will require a detailed analysis of elements newly-added such as recruitment, diversity, and selectivity. CAEP now expects EPPs to not only measure program impact but to also be involved with self-study concerning its own EPP-recruiting efforts. With this new standard, EPPs will need to conduct on-going studies concerning their in-house recruiting efforts through initiating and tracking recruitment efforts to determine which efforts are most (and which are least) successful. The EPPs data analysis in this area is part of the larger emphasis on ensuring that all instruments used and the results produced across standards provide valid and reliable data that may be used for program decisions and to potentially predict future outcomes.

The aforementioned transitions involving the 2013 program standards also demonstrate the evolving role of CAEP as an accreditation agency. As noted previously, NCATE first existed to ensure the professionalization of teaching and to examine the efforts of EPPs (formerly units) in providing appropriate faculty, resources, and facilities to prepare teachers (CCSSO, 1969). Today, CAEP's (2018d) new mission is stately succinctly on their website. There it states, "CAEP advances equity and excellence in educator preparation through evidence-based accreditation that assures quality and supports continuous improvement to strengthen P-12 student learning" (Vision, Mission, & Goals section, para. 2).

Evolving Digitalization. A final theme emerging from the four EPP accreditation reports concerns changes in EPP accreditation pursuits pertaining to evolving digitalization in preparation of reports, data findings, summaries, and conclusions. From the 1961 to 1981 reports, the most apparent changed involved the shift from a typewriter indicated by the typeset within the 1961 report to the word processor indicated by the typeset within the 1981 report. Due to this evolution, changes within programs at the EPP, and the progression of NCATE standards, the 1981 report is substantially larger and includes a greater level of data analysis when compared with the 1961 report. The 1961 report included a summary of the programs offered. The 1981 report included "folios" for each separate program with much greater specificity with each program summarized for approximately five pages apiece. In both the 1961 and 1981 reports, appendices are included with different measuring instruments (e.g., surveys, test descriptions, etc.). However, the EPP-produced surveys in the 1981 accreditation report contain more detailed information than the 1961 report survey examples. The EPP included new survey tools involving specific competencies in subject area preparation along with new survey items concerning the student internship experience and the knowledge, skills, and dispositions exhibited in this experience. In addition, the EPP included new measures administered to the candidate after the candidate's completion of the internship experience. It appears the EPP's

access to new technology tools provided new opportunity to create, evaluate, revise, and report greater levels of information.

From the EPP's 1981 accreditation report findings to its 2005 accreditation report findings, digitalization evolved at an astonishing rate (Carter, 2008). Neither NCATE nor EPPs ignored this evolution. By the time of the 2005 report, hardware, software, and Internet capabilities provided new opportunities for the collection, storage, analysis, and reporting of data. NCATE recognized this evolution and encouraged web-based submissions (NCATE, 2003). NCATE further encouraged institutions to create their own website storage areas to present their continuous improvement evidence and findings.

The EPP in this study followed this request in preparation for the 2005 accreditation report submission. The EPP's Standard 1 and Standard 2 submissions alone resulted in approximately 250 linked files within its secure-website presentation of information. The EPP included files involving inputs such as syllabi, curriculum, faculty, resources, facilities, meeting minutes and agendas, and peer review information among other files. The EPP also included files involving artifacts, data produced from these artifacts, employer follow-up data, graduate follow-up data, preservice teachers' impact on student learning information, and other files linked within this website.

Following the successful 2005 accreditation visit, NCATE shortly thereafter pursued a new accreditation effort with TEAC (CAEP, 2018a). From these interactions, CAEP was established. One of the first efforts of CAEP was to develop new standards of accreditation, which were completed in 2013. After completion of these standards, CAEP initiated work on the AIMS system for data collection.

This system allowed EPPs to submit annual reporting data, Specialized Program Association (SPA) reports, CAEP accreditation reports, along with extensive EPP information regarding faculty, programs, and governance structures within the EPP among other select information. With this transition, EPPs no longer submit reports, data, and findings on their own websites. Instead, CAEP expects all EPPs to submit information via this newly developed AIMS tool. Benefits of this new tool include a well-developed and centralized storage and reporting space devoted solely to this effort. Detriments include limitations on submissions and the learning curve associated with submitting within this new tool.

Conclusion

This case study identified, from content analysis of four EPP accreditation reports from 1961, 1981, 2005, and 2020, several themes under two main categories. The two categories included *Continuing Trends across the EPP Reports* and *Changes across the EPP Reports*. Within each category, three themes emerged. Concerning trends, the themes of *Persistence in Shortage Areas*, *Stage II Application Requirements*, and *Program and Course Preparation with Field Experiences* emerged. Concerning changes, the themes of *The Teacher Accountability Emphasis*, *Program Impact*, and *Evolving Digitalization* emerged. Authors of each EPP accreditation report seemed to identify and sometimes wrestle with these areas in attempting to collect, store, analyze, and make data-driven decisions as NCATE/CAEP accreditation standards and expectations continued to evolve.

The trends and changes identified in this study should be beneficial in informing other EPPs in their accreditation pursuits and continuous improvement efforts. For example, as trends

such as persistent teacher shortage areas remain, they will require EPPs to continue to pursue approaches to address these concerns in candidate recruitment and retention. In addition, as the evolving accountability emphasis continues, trends involving robust application requirements and more-extensive field experiences will likely need to be deliberated as EPPs seek to continuously improve their initial licensure programs. Within these efforts, the role of increased digitalization and attention to program impact on P-12 learners will need to be fully considered.

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Investigating the Effect of Using E-Portfolio on Preservice Teachers' Self-Efficacy, Proficiency and Intention to Use Technology in their Future Classroom

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Abstract

The purpose of this study was to investigate the effect of using e-portfolio on preservice teachers' self-efficacy, proficiency and intention to use technology in their future classroom. By utilizing theory of planned behavior (TPB) as theoretical framework, the researchers employed a mixed method to identify the strength of the effect of using e-portfolio has on preservice teachers' attitudinal beliefs, subjective norms, and perceived behavioral control leading to change in their intention to use technology. Participants were 36 preservice teachers enrolled in one graduate section and two undergraduate in a required technology integration course in a Midwest university. Multiple linear regression analysis was conducted to develop a model predicting preservice teachers' use of technology in future classrooms from their attitudinal beliefs, subjective norms, perceived behavioral control and intention. The results of the predictor model was able to account for 55% of the variance in students' intention to use technology and was statistically significant. The results also found that students' perceived proficiency is a significant predictor of their use of technology in future classroom. Furthermore, the use e-portfolio as teaching and assessment methods improved students' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms compared to beginning of the semester. Students seem to favor this assessment method and found it beneficial to their learning. Many students indicated that using e-portfolio as learning and assessment tool gave them sense of control to create personalized artifacts, manage and support their learning goals, and communicate their questions and progress with others. Further, the majority of students emphasized the importance of connecting their artifacts and projects they worked on to their own context and experience.

Keywords: e-portfolio, theory of planned behavior (TPB), technology integration, preservice teachers' intentions

Introduction

With the increase use of technology tools in classrooms, training preservice teachers to integrate technology in specific content area using a "traditional" lecture method, does not provide them with the context for classroom application. Researchers recommend that to use technology effectively in a classroom, teacher must master the interplay of three primary forms of knowledge: knowledge of content, good pedagogical practices, and technical skills as well as an understanding of how these forms of knowledge interactively relate to one another (Mishra & Koehler, 2006). Further, social learning theorists (i.e., Bandura, 1977; Vygotsky, 1978) asserted that learning process is complex, multidimensional, and connected to the learner's experiences. Although the new generation majoring in education are mostly familiar with social media and online interaction technologies, there is growing concern as to whether they are prepared to integrate technology tools into effective lessons for their students based on sound pedagogy (Nilson, 2016).

One of the widely used methods in teaching and assessment to prepare preservice teachers is the use of e-portfolios. The increase use of e-portfolio in learning settings was primarily driven by the widespread availability of web-based platforms and multimedia content (Clark & Eynon, 2009; Duncan-Pitt & Sutherland, 2006; Linda, Maor, & Schibeci, 2011). Further, e-portfolio found to provide learners with access to many digital resources and tools that allow them to collaborate with their peers (Strampel & Oliver, 2010). Consequently, many researchers recommended the use e-portfolio as a platform for teaching and assessment (Barrett, 2006; Housego & Parker, 2009; Oakley, Pegrum, & Johnston, 2014). Although many studies investigated the effectiveness of the e-portfolio preparing preservice teachers to integrate technology, there is limited research that examined the effect of e-portfolio to improve students' intentions to integrate technology in their future classrooms. Therefore, the purpose of this study was to investigating the effect of using e-portfolio on preservice teachers' self-efficacy, proficiency and intention to use technology in their future classroom.

Literature Review

Social learning theorists assert that learning takes place not in isolation but through observation and modeling in social settings and therefore students' interaction is very crucial for their learning (Dewey, 1997; Vygotsky, 1978). Many researchers argue that e-portfolio aligns with the core idea of social learning theories because it allows students to interact and collaborate with peers while thinking independently (Barbera, 2009; Driessen, Van Tartwijk, Overeem, Vermunt, & Van Der Vleuten, 2005; Meyer, Abrami, Wade, Aslan, & Deault, 2010; Wang, 2010). Furthermore, using technology with e-portfolio gives students the ability to be key decision-makers in the learning process and allowing students to find the appropriate pace for their personal learning needs (Davis, Ponnamperuma, & Ker, 2009; Tangdhanakanond & Wongwanich, 2012). Utilizing the emerging technology tools in e-portfolio found to promote teacher-student and student-student interactions across different ages and geographic locations and help them create artifacts that are relevant to them (Kanuka & Anderson, 2007; Strydom & Barnard, 2017).

In such diverse learning environment, assessing student using traditional test may not be the ideal way to evaluate their mastery of the learning content. Many researchers recommend that students' assessment should take other forms such as individual written reports, a multimedia presentation, a physical model, class discussions or e-portfolio (Burner, 2014; Griffin & Care, 2014). One of the main advantages of using e-portfolio as assessment tool is providing a richer, deeper, and more accurate assessment of what students have learned, compared to traditional methods that only measure what students know at a specific point in time (Bok et al., 2013; Meeus, Van Petegem, & Van Looy, 2006; Yastibas & Yastibas, 2015). Many researchers found that the use of e-portfolio allow students to ask, communicate and observe their peers' work and ideas to construct their own projects. E-portfolios also is considered better over paper-and-pencil portfolios, especially in a technology course, due to the ability to include multimedia and the ease of sharing with others using the World Wide Web.

Theoretical Framework

The present study utilized the theory of planned behavior (TPB) (Icek Ajzen, 1985, 1991) to assess the intention change of preservice teachers regarding technology integration. According to TPB, there are three main factors may predict individuals' intention to perform a specific

behavior: attitudes (individual's feelings about performing a behavior), perceived norms (individuals' perceptions of the social pressure to perform a behavior), and perceptions of behavioral control (PBC) (individuals' perceived ability to perform a behavior). Individual's Attitudes represent the overall evaluation of the significance of a particular behavior. If the behavior in question is believed to have positive consequences to the individual, it is more likely that he or she will be expected to perform the behavior. Perceived norms represent the individual's perceptions of the social pressure to perform a behavior. If individual believes that significant others (e.g., peers, students, superiors) want him or her to perform a specific behavior it is more likely that the individual will perform the behavior. Finally and consistent with Bandura's self-efficacy (1977, 1982), TPB adds perceived behavioral control (PBC) as a predictor of intention to perform a behavior (i.e., individual's perception as to how easy or difficult they can perform a behavior).

Intention according to TPB is an indication of a person's readiness to perform a given behavior and is assumed to be the immediate antecedent of behavior (Fraser et al., 2010). It is thus postulated that PBC and behavioral intention can be utilized to directly predict behavioral achievement. Especially, when behaviors pose no serious problems of control, they can be predicted from intentions with considerable accuracy (Icek Ajzen, 1991). Given this close relationship between intention and behavior, individuals' intention is considered to be the most important factor in predicting their decision to take a specific action. For example, many studies utilizing TPB framework found that attitude towards the behavior, subjective norm, and perceived behavioral control accounted for change in behavior and intention (Armitage & Conner, 2001).

In the context of the present study and based on the TPB, the researchers hypothesized that if preservice teachers are attending a technology integration course and use e-portfolio as learning and assessment tool, they will be anticipated to improve their intention to integrate technology in their future classrooms when: they improve the mastery of the use of technology in teaching. Second, when their peers, their students and their superiors favor them to do so. Finally, when they are confident to integrate technology in their future classrooms.

Research Questions

Although large body of research investigated the applications and practices of the e-portfolio in different learning context, there have been limited research to examine its effect on preservice teachers' intention change to integrate technology in their future classrooms. Therefore, the purpose of this study was to investigate the effect of using e-portfolio as teaching and assessment tool on preservice teachers' self-efficacy, proficiency and intention to use technology in their future classroom. This study was guided by the following research questions:

1. What factors best predict preservice teachers' intentions to integrate technologies in their future classrooms?
   This primary research question was at the heart of the study, as the answer to this question will inform educational technology instructors and course developers to identify factors that may improve preservice teachers' intention regarding use of technology in teaching.
2. Does e-portfolio improve preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms?
   This question attempts to assess the overall effect of the use of e-portfolio on preservice

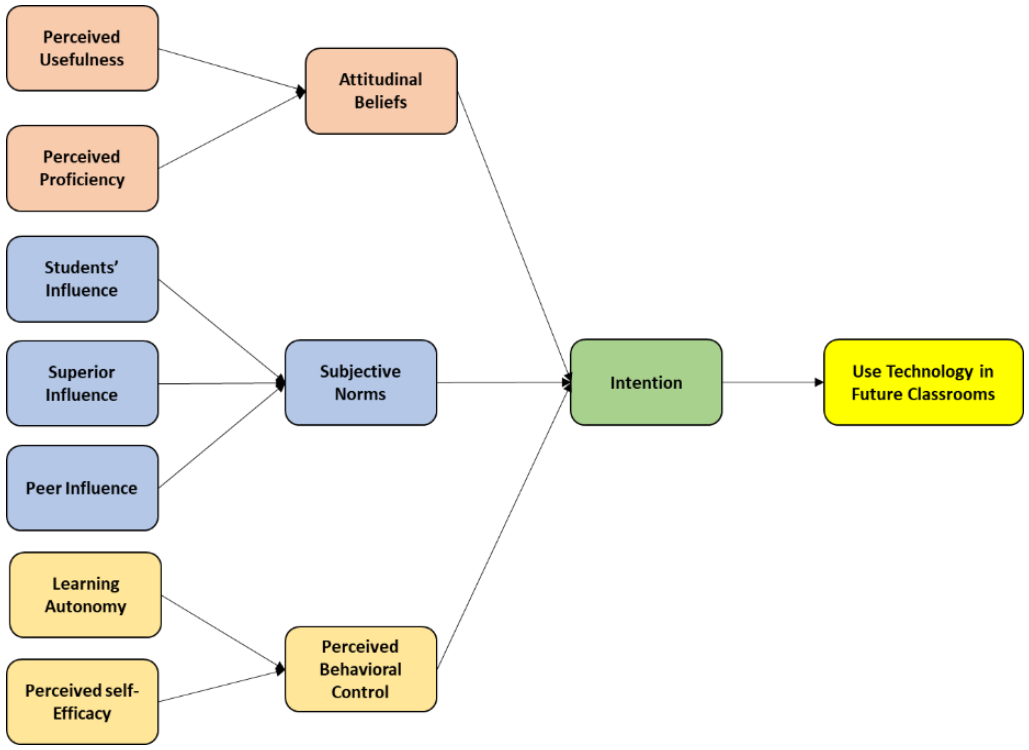
teachers. Specifically, the answer of this question will find whether preservice teachers will benefit from the use of e-portfolio on these variables or not.

3. Open ended question on students' opinion regarding the learning environment (the use of e-portfolio as teaching and assessment tool)
   Allowing preservice teachers to express their opinions regarding the use of e-portfolio as teaching tool will give them a platform to reflect on their own experiences. Further, inquiring about students' insight and feedback could become an indicator for their intention and opinions to incorporate technology tools in their future classrooms.

Study Model Framework

Grounded in TPB (Icek Ajzen, 1991), this study employed a model with four main constructs to predict students' technology integration in their future classrooms: Students' attitudinal beliefs, Students' subjective norms, Students' perceived behavioral control and students' intention to integrate technology in their future classroom:

Figure 1: Study Model addressing Preservice Teachers' Intention to Use Technology in their Future Classroom



Research Hypotheses

Based on the above research model, the researchers have articulated the following hypotheses to test the research questions.

Attitudes:

The effect of using e-portfolio as teaching and assessment tools in a technology integration course on preservice teachers' intention to use technology in their future classroom.
H1: Preservice teachers' attitude positively affects their intention to use technology in their future classroom.
H1 a: Perceived usefulness positively affects preservice teachers' intention to use technology in their future classroom.
H1 b: Perceived proficiency positively affects preservice teachers' intention to use technology in their future classroom.

Subjective Norms

H2: Preservice teachers' subjective norms positively affect their intention to use technology in their future classroom.
H2a: Superiors influence positively affects preservice teachers' intention to use technology in their future classroom.
H2b: Peer influence positively affects preservice teachers' intention to use technology in their future classroom.
H2c: Students influence positively affects preservice teachers' intention to use technology in their future classroom.

Perceived behavioral control

H3: Preservice teachers perceived behavioral control positively affect their intention to use technology in their future classroom.
H3a: Self-efficacy positively affects preservice teachers' intention to use technology in their future classroom.
H3b: Learning autonomy positively affects preservice teachers' intention to use technology in their future classroom.

Behavioral intention

H4: Preservice teachers' behavioral intention positively affects the use of technology in their future classroom.

Methodology

Research design

This study employed mixed method to examine the effect of e-portfolio on preservice teachers' intention to integrate technology in their future classroom. The quantitative method used multiple linear regressions to identify the strength of the effect that e-portfolio has on preservice teachers' attitudinal beliefs, subjective norms, and perceived behavioral control leading to change in their intention to use technology in their future classroom. The qualitative method used an open-ended question to ask students regarding their personal opinion about the use of e-portfolio as learning and assessment tools. Data were collected through using an online survey questionnaire to collect their opinion, demographic information and participants' responses to multiple items measuring each construct reflected in the research model (Fig. 1). IRB was obtained for this study and all ethical requirements were observed.

Participants

The researchers employed a convenient sample to select participants in the current study. Participants were preservice teachers (n = 56) enrolled in three different sections in a required technology integration course in a Midwest university (one graduate section and two

undergraduate). Out of the 56 participants, 36 students completed all surveys and received course extra credit for participation. The following statistics describe their demographic characteristics: All participants were fluent in English. 27 undergraduate (75%), 9 graduate (25%), 5 male students (14%) and 31 female (86%). Age: 23 students were 18-21 years (64%), 3 students (22-25) (9%), 3 students (26-30) (9%), 5 students (31-40) (13%), and 2 students were 41 or above (6%). Students' majors were: 22 students elementary Education (61.1%), 7 student middle education (19.4%), 3 students high school (8.3%), 3 students other majors (8.3%) and 1 student early childhood education (2.8%). Students' ethnicity: 31 students White / Caucasian (86.1%), 2 American Indian / Native American (5.6%), 1 Black / African American (2.8%), and 2 students Hispanic / Latino (5.6%). Students' learning preferences: 16 students prefer experimentation (44.4%), 1 student collaborative group work: experiential learning, role-play, lectures/discussions: listening to lectures or podcast, discussing (2.8%), 1 student books/related written material: reading texts or notes (2.8%), 4 students video/movies/media (11.1%), 1 student hands-on activities: hands-on, creativity, model building, note-taking, and physical involvement in learning (2.8%), and 13 students prefer mixed method between all of the above (36.1%).

Instruments

Researchers in this study employed two questionnaires: Demographics and TPB surveys. The demographic questionnaire consisted of eight categorical response-type items to collect information about the participants' makeup, such as students' gender, age, years in college, major, ethnicity and learning style. The TPB survey was adapted from Ajzen (2014) and modified to measure constructs predicting students' intention to use technology in their future classrooms. The TPB survey consisted of four sections: Attitudinal Beliefs, subjective norms, perceived behavioral control and intention.

Attitudinal Beliefs. This construct comprised of two items: students' perceived usefulness of using technology in their classrooms and perceived level of proficiency to use technology. The questionnaire was to solicit about students' perceived usefulness of technology tools they created or used during attending the technology integration course. For example, a question was: I would have no difficulty explaining why technology may or may not be beneficial. Students had the five-point Likert scale to choose from (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree). Regarding students' perceived level of proficiency to use technology, students responded to several statement to solicit about their perceived level of proficiency. For example, a question was: Please list your level of proficiency with the following technology tool (technology tools they learned about, created or used during attending the course such as building educational website, etc.): Students' responses were measured using four-point Likert scale (1 = Never Use, 2 = Novice, 3 = Competent, 4 = Proficient).

Subjective Norms. This construct comprised of three items: students' influence, superior influence and peer influence. Subjective norms: Students responded to several statement soliciting about the influence of their students, superior and peers on their decision to use technology in future classrooms. For example, a sample question was "My students will think it is important to use technology in my classroom", "My superiors will think it is important to use technology in my classroom" and "My peers will be using technology in their classrooms". Students can indicate their choices from five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree).

Perceived Behavioral Control. This construct comprised of two items Students' learning autonomy and perceived self-efficacy. A sample question solicit about students' learning

autonomy was “I am comfortable with using technology in teaching and learning”. Students choose one from four-point Likert scale (1= not at all comfortable, 2 = a little comfortable, 3 = fairly comfortable, 4 = Very comfortable). To solicit about students’ perceived self-efficacy, they were asked several questions to solicit about confidence to conduct different tasks related to integrating technology in a classroom. An example of a question was: “After concluding technology integration in teaching and learning in your content area: How certain are you that you can use technology your content area to increase productivity, promote creativity, and facilitate academic learning. Rate your degree of confidence by recording a number from zero to 100 using the scale given below”. Students can indicate one from eleven-point Likert scale (1 = 0 cannot do at all to 11 = 100 highly certain can do).

Intention: Students’ intention to use technology in their future classroom was addressed through several statements such as “I plan to use the following technology tool in my future classroom to supplement my students' learning”. Tools include building educational website, cartoon strip, online collaboration, digital storytelling, digital flashcards, animation, podcast, instructional games, interactive whiteboard video, smart board lesson, social networking, and WebQuest. Students’ responses were measured using true or false scale (1 = False, 2 = True).

The open-ended question was ask about students’ opinion regarding e-portfolio. Student were asked “In your opinion, what do you think of using e-portfolio to learn about technology integration? Students were free to express their opinion in a paragraph format with no limited space.

Validity and Internal Reliability of the Measurement Instrument

The researcher assessed the construct validity of all used scales and found that all variables were significantly correlate to each other. The Pearson correlation coefficient was calculated for each scale, and it was positive and significant. The Cronbach’s alpha internal consistency reliability ranged from 0.383 to 0.695.

Procedure

Students completed all surveys during the first week of the semester and then they attended a 15-week technology integration course. Students created projects and artifacts for all the learning topics. The final project was creating a personal e-portfolio to compile and present all projects created during the semester. At the end of the semester students completed a modified version of the same surveys they completed during the first week of the semester.

Results

Data Preparation and Screening. All eight variables were screened for incomplete or unengaged responses (students who answer the exact same value for every question on the survey leading to zero variance). Responses with more than 20% missing values (9 records) and unengaged responses (11 records) were removed from the data set. Responses less than 5% missing values were replaced with the median for ordinal scales and the mean for continuous scales (4 records).

Multiple Regression Assumptions. The regression descriptive statistics output was checked for multicollinearity assumption between predictor variables and found that correlations between variables were less than 0.7 and therefore none of included predictors has multicollinearity. Further, all predictor variables correlate with the outcome variable (student’s intention) at a value greater than 0.3. The linear relationship between the independent variables

and the dependent variable was checked through the probability plot and found that all points were following a straight line. Then the scatter plot was checked and found that regression standardized residual on the y-axis and the regression standardized predicted value on the x-axis within negative 3 to 3. Next the residuals statistics was checked through standard residual and found that standard residual the minimum -2.008 and the maximum 2.023. Finally, the Cooks Distance was checked and found that the minimum was .000 and the maximum .505 and it was less than 1. ANOVA table showed that there is statistical significance and therefore we reject the null hypothesis that the regression slope is 0. The researchers used the adjusted R-square (this research has small sample size 36 cases) and the dependent variable (intention) is normally distributed (Kolmogorov-Smirnova = .200).

Research Questions:

First Question. To answer the first question "What factors best predict preservice teachers' intentions to integrate technologies in their future classrooms?" the investigators conducted multiple regression analysis to identify the unique variance predicted by independent variable.

Multiple Regression Analysis. Regression finding: Multiple linear regression analysis was conducted to develop a model predicting preservice teachers' use of technology in future classrooms from their attitudinal beliefs, subjective norms, perceived behavioral control and intention. The predictor model was able to account for 55% of the variance in the dependent variable and was statistically significant at $p < .000$. Individual predictors were examined further and the result indicated that out of the seven independent variables, the only variable found to be a significant predictor of preservice teachers' use of technology in future classroom was their perceived proficiency (t = .519, p = .002). Basic descriptive statistics and regression coefficients summarized in Table 1.

Table 1

Standard Multiple Linear Regression of Students' Intention to Integrate Technology in their Future Classrooms Reported by Preservice Teachers in Technology Course based on their perception of their attitude toward technology usefulness, proficiency, peer, student and superior influences, learning autonomy and self-efficacy (n=36)

		Attitude		*Subjective Norm (Influence)*			*Behavioral Control*						
	INT	USE	PRO	PI	SI	SUI	LA	SE	***β***	***β (Unique)***	***Sig.***	***M***	***SD***
USE	.410*	1							0.222	0.181	0.118	13.42	1.746
PRO	.695**	0.183	1						0.519	0.384	0.122	78.08	12.318
PI	.425**	0.163	0.301	1					0.102	0.071	0.002	7.97	1.647
SI	.434**	.520**	0.165	.511**	1				0.152	0.098	0.534	17.33	2.014
SUI	.383*	0.031	0.32	.342*	0.285	1			0.102	0.089	0.393	8.42	1.442
LA	.347*	.372*	.401*	-0.134	.342*	0.041	1		-0.02	-0.014	0.439	9.03	0.774
SE	411*	0.015	.482**	0.124	0.059	0.273	0.296	1	0.114	0.096	0.899	792.22	148.941
Intercept	-53.579										0.403	107.81	20.788

Note. ** *Correlations Coefficient* $p < 0.01$, * $p < 0.05$; Sig. Indicate the unique variance predicted by independent variable. Intention=INT, Usefulness=USE, Proficiency=PRO, Peer Influence=PI, Student Influence=SI, Superior Influence=SUI, Learning Autonomy=LA, Self-efficacy=SE

Second Question. To answer the second question "Does e-portfolio improve preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms?"

The investigators conducted a paired-samples t-test. The results show that the mean of all three variables at the end of the course differ significantly from the mean of all three variables prior to attending the course with project-based teaching method: students' perceived self-efficacy before (M = 571.75, SD = 172.712) and after using project-based teaching method (M = 800.83, SD = 149.193), perceived proficiency before (M = 46.97, SD = 11.977) and after using project-based teaching method (M = 78.08, SD = 12.318), and intention to use technology in their future classrooms before (M = 66.92, SD = 17.084) and after using project-based teaching method (M = 85.89, SD = 19.257) at the .000 level of significance (t = 6.304, 13.033, 7.102, df= 35, n = 36, p < .000, 95% CI for mean difference 155.307 to 302.860, 26.265 to 35.957 and 13.549 to 24.396). These results suggest that the use e-portfolio does improve preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms. Basic descriptive statistics and paired samples t-test summarized in Table 2.

Table 2
Basic descriptive statistics and paired samples t-test comparing preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms before and after (n=36)

				95% Confidence Interval of the Difference				
		Mean	SD	Lower	Upper	t	df	p
Pair 1	Perceived self-efficacy After	800.83	149.193	155.307	302.860	6.304	35	.000
	Perceived self-efficacy Before	571.75	172.712					
Pair 2	Perceived proficiency After	78.08	12.318	26.265	35.957	13.033	35	.000
	Perceived proficiency Before	46.97	11.977					
Pair 3	Intention After	85.89	19.257	13.549	24.396	7.102	35	.000
	Intention Before	66.92	17.084					

Note. $p < 0.000$

Discussion and Scholarly Significance of the Study

The purpose of the present study was to examine the effect of e-portfolio on preservice teachers' intention to integrate technology in their future classrooms. The study results suggest that e-portfolio influenced students' intention to integrate technology in their future classrooms. Further, the use of e-portfolio as teaching and assessment methods improved students' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms compared to beginning of the semester. Students also seem to favor this learning method and found it beneficial to their learning.

The first question was to identify factors best predict preservice teachers' intentions to integrate technologies in their future classrooms. The results of the current study indicated that preservice teachers' attitude toward their intention to use technology is generally a better predictor of intention to act than subjective norm or behavioral control. These findings were demonstrated by the multiple linear regression results that indicated that although students' attitude, subjective norm and behavioral control account for a collective of 55% significant effect on their intention to use technology, students' perceived proficiency to use technology was the only statistically significant predictor in the model. The finding in this study is consistent with findings from other studies that concluded that attitude toward the behavior is generally a better

predictor of intention to act than subjective norm (Ahmad & Rainyee, 2014; Montano & Kasprzyk, 2015).

The second question the effect of e-portfolio on preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technologies in their future classrooms. The results show that the mean of all three variables at the end of the course differ significantly from the mean of all three variables prior of attending the course. These findings were demonstrated by the significant difference of all mean scores of three variables after using e-portfolio compared to prior of attending the course. This results suggest that e-portfolio does improve preservice' teachers' perceived self-efficacy, perceived proficiency and intention to use technology in their future classrooms. These finding are also consistent with finding from other studies, where the use of e-portfolio improved students learning (Hatcher, Shaker, & Freeman, 2016; Ivanova, 2017; Kenny, 2015).

One possible interpretation for this result is that the method of creating learning projects and e-portfolios in current study resulted on several positive outcomes echoed in students' feedback and course grades. Many students favored this type of learning environment, where it gave them sense of control to create personalized projects, manage and support their learning goals, and communicate their questions and progress with others. The majority of students emphasized the importance of connecting the projects to their own context and experience. For example, a student said "the instructor allowed us to work on the assignments in the way that we thought would work best for us and he was always here to help whenever I needed." Other students preferred to work at their own pace and be creative, or as a student puts it "the learning setting allowed me to explore my creative side because we were given the freedom to work on our projects on our own pace and I had plenty of time to complete all work."

Utilizing the e-portfolio as an assessment tool helped improve preservice teachers' perceived self-efficacy and intention to use technology in their future classrooms. This was evident from the comparison of the survey results of students' self-efficacy and intention given to them at the first and the last weeks of the semester. According to the theory of planned behavior (Icek Ajzen, 1985, 1991), individuals' behavior can be changed by modifying their intention to act on this behavior by involving both affective and cognitive processes that lead to positive changes. Further, individuals will intend to take an action (incorporate technology tools in their future classrooms) when they are confident in their ability to do so. In the current study, students showed positive changes in their self-efficacy and intention in both graduate and undergraduate sections through their course comments and surveys' results. Many students indicated that creating the e-portfolio helped them to share their work with others and integrate the produced projects in their own classrooms. A student said: "I was able to take a lot of the things I learned about and created and pass it along to my co-teachers. The e-portfolio gave me a desire and ability to learn more about technology and how to use it in my own classrooms." Another student indicated that connection between the e-portfolio projects and seeing its benefits for job seeking and in class teaching improved her self-efficacy by saying: "There was such an array of technology options presented in this class. It showed me that finding material to use in my future classrooms is easier than I thought. It opened my eyes to new and helpful technologies that can be useful in the classroom and very beneficial for my teachings, no matter which subject it is. My e-portfolio is something I will use definitely in my future on my resume."

In conclusion, the use of e-portfolio as teaching method and assessment tool with preservice teachers improved their self-efficacy, academic achievement and has the potential to change their intention to use technology in their future classroom.

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Using Activity Trackers to Meet Arkansas Technology and Physical Education Standards (Pilot)

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Abstract

Sixty-four fourth grade students wearing Fitbits and Digi-Walkers were randomly assigned to one of four conditions for 10 weeks to determine (a) if there was a significant difference in post-test quiz scores covering seven Arkansas Computer Science and two Physical Education Standards among the four conditions, and (b) if post-test scores were significantly higher than pre-test scores. The results of the ANCOVA found no significant differences among the conditions ($F = .516$, $p = .67$.). The results of the paired t-test found mean post-test scores ($M = 7.14$) were significantly higher than pre-test scores ($M = 6.38$).

Introduction

One of the major factors associated with increased activity in youth is having the intention and/or motivation to be active (Miller & Mynatt, 2014; Sallis, Prochaska, & Taylor, 2000). Activity trackers such as Fitbits and Digi-Walkers help provide that motivation (Harris, 2016; Horne, Hardman, Lowe, & Rowlands, 2009; Miller & Mynatt, 2014). Fitbit technology gives wearers immediate fitness feedback and enables students to have independent access to their workout data. Such access allows students the opportunity to analyze their progress, compare their data to previous days, and interpret the results presented in a variety of chart and graphic formats.

Review of Literature

Obesity is considered the number one health risk for children in the United States (Centers for Disease Control and Prevention, 2017). Children of low income families are at a greater risk of being overweight or obese (Johnson, Montgomery, & Ewell, 2016). Arkansas is one of the three poorest states in the country (U.S. Census Bureau, 2015) and ranks sixth in the nation in childhood obesity (Segal, et al, 2017). Being obese or overweight also has a negative impact on the social and emotional lives of children (American Heart Association, 2010; Janzi, Boros, Letuchy, Kwon, Burns, & Levy, 2017). Physical activity is considered one of the most important components in preventing and decreasing childhood obesity (National Education Association, 2008), and using Fitbit® technology may motivate students to not only increase their activity but to increase their technology skills as well. There is a need to fill the gap in the technological opportunities of children from low income families (Schaefer, Ching, Breen, & German, 2016). The National Education Association states the need for rural schools to include creative, technology-enriched programs for the greatest gain in student achievement (National Education Association, 2008). As stated by former NEA president, Dennis Van Roekel, "If our children are to excel in a fast-changing, global society, we must harness the technology resources they need to function in a digital society" (National Education Association, 2008).

According to the Centers for Disease Control and Prevention (2017), the percentage of children with obesity in the United States has more than tripled since the 1970s. Overweight or

obese children are more likely to be obese as adults (Segal, et al, 2017). Over $14 billion additional healthcare costs are associated with children being overweight or obese (Froberg & Andersen, 2005) making it more expensive than smoking or problem drinking (American Heart Association, 2010). Children with low levels of physical activity are at risk of developing obesity and chronic diseases later in life (Froberg & Andersen, 2005; Janzi, et al, 2017). Therefore, the physical activity of children needs to be monitored (Johansen, Holm, Pearson, Kjaersgaard, Larsen, Hojgaard, & Cortes, 2015), and activity trackers (e.g., Fitbits®, pedometers, accelerometers, etc.) provide an objective means to do so (Kim & Lochbaum, 2017). Because children from low-income families are at greater risk for obesity, it is particularly important to provide information and opportunities regarding physical activity early to improve their future health (Segal, et al, 2017).

Physical activity among children increases cognitive and academic performance of children (Basch, 2011), and one of the major factors associated with increased activity in youth is having the intention and/or motivation to be active (Miller & Mynatt, 2014; Sallis, et al, 2000). Activity trackers such as Fitbits® and pedometers help provide that motivation (Harris, 2016; Horne, et al, 2009; Miller & Mynatt, 2014). Fitbit® technology gives wearers immediate fitness feedback and enables students to have independent access to their workout data (e.g., heart rates, distances, steps, etc.). Such access allows students the opportunity to analyze their progress, compare their data to previous days, and interpret the results presented in a variety of chart and graphic formats. In this multidisciplinary study, nine Arkansas Frameworks Standards are incorporated, two from physical education and nine from computer science.

Purpose

The purpose of this study is to determine (a) if using Fitbits and Digi-Walkers to monitor physical activity will help students obtain Arkansas Computer Science and Physical Education Standards as measured by pre and post-test 10-point quizzes, and (b) if there is a significant difference in post-test scores among the four conditions. We hypothesized that by inputting, tracking, and comparing Fitbit and pedometer data over 10 weeks, students will perform significantly higher on the post-test measuring seven of the Arkansas State Standards for Computer Science and two for Physical Education. This is one of several studies regarding a pilot for the project, Enhancing the **F**itness and **A**cademics of **C**hildren using **T**echnology in the **S**chools (Enhancing the **FACTS**).

Methods

Subjects

This study received IRB approval before students, parents, and/or guardians were contacted. Sixty-four fourth grade students (n = 24 males, n = 40 females) from a rural elementary school who received consent from their parent/s or guardian/s participated.

Instrument

We developed a 10-point quiz to assess two Arkansas State Standards for Physical Education and seven for Computer Science. A computer science professor, four fourth grade elementary classroom teachers, and two physical education specialists checked the quiz for content validity and readability. The questions and the Arkansas Physical Education (2013) and Computer Science Standards (2016) they assessed are as follows:

1. Which of the following measures heart rate? Arkansas Standard PEL.3.4.2 “Demonstrate a procedure for monitoring heart rate.”
2. Which of the following activities is BEST suited for maintaining a moderate to vigorous level of activity? Arkansas Standard PEL.3.4.3 “Maintain a moderate to vigorous intensity level in a variety of activity settings.”
3. Which of the following can measure number of steps taken during an activity? Arkansas Standard D.5.4.1 “Compare and use appropriate tools to collect data.”
4. How does the computer receive Fitbit information about heart rate and steps? Arkansas Standard CC.9.4.2 “Recognize that computers perform actions or outputs based on input by humans,” and Arkansas Standard CC.11.4.3 “Identify that information can be transmitted using computing devices via a network.”
5. Which of the following is/are true about using equipment such as Fitbits, computers, and pedometers? Arkansas Standard CC.10.4.2 “Recognize the expense of the equipment and how care and protection of the computer can prolong use and save the cost of purchasing new equipment therefore benefiting all students.”
6. Which of the following might contribute to being unfit if done for four hours each day? Arkansas Standard CGE.12.4.1 “Identify and discuss positive and negative impacts of technology on the daily life of individuals and society.”
7. Which of the following are positive aspects of using technology? Arkansas Standard CGE.12.4.1 “Identify and discuss positive and negative impacts of technology on the daily life of individuals and society.”
8. Which of the categories in the chart below represent three days of step data in which the first day was 1,500 steps, the second day was 1,000 steps, and the third was 2,000 steps? Arkansas Standard D.4.4.1 “Compare the representation of existing data in multiple formats.”
9. Which of the charts below match the information in the chart above? Arkansas Standard D.5.4.3 “Compare different ways to visually represent data with pictographs, bar graphs, and line plots.”
10. Graph the Resting Heart Rates (RHR) for each day in the chart below. Arkansas Standard D.6.4.1 “Explore graphs as models for data analysis.”

Conditions

We gathered two weeks of baseline Fitbit data before randomly assigning the four classes of fourth graders to one of the following four conditions/treatments: ONE, the students wore the Fitbits and Digi-Walkers from 8:00 a.m. to 3:00 p.m. on the day they had physical education and monitored their steps throughout the day by looking at their activity trackers; TWO, same as ONE except students recorded their number of steps as shown on the activity trackers at the end of the day; THREE, same as TWO except instead of recording their number of steps, the students charted their Fitbit and Digi-Walker steps in both a line graph and bar graph; and FOUR, same as ONE except the students synced their Fitbits with a computer and viewed their data using the Fitbit software program.

Procedures

Prior to wearing the activity trackers, students took a 10-point quiz in their homeroom classes at the beginning of the spring semester covering seven Arkansas State Standards for Computer Science and two for Physical Education. After 15 weeks, the students took the quiz again. All recording, charting, and syncing occurred during their last period, physical education

class which they had one day a week. In addition to the various conditions/treatments, at the end of the physical education class, when the students turned in their activity trackers, they got pencils and received slips of paper with the date, a fitness fact, and space for them to write how many steps they got that day to take home.

Statistical Analysis

An Analysis of Covariance (ANCOVA) was applied to the quiz data (covarying on pre-test scores) to determine if there was a significant difference in post-test scores among the four groups. In addition to the ANCOVA, a paired t-test was applied to pre and post-test scores to see if students' scores significantly improved after 10 weeks of treatment using the Fitbits and Digi-Walkers. In order to decrease the chance of making a Type I Error and to account for the inflation of alpha with multiple tests, a Bonferoni adjusted alpha of .025 was used to determine significance.

Results

Levene's test and normality checks were carried out and the assumptions met. The adjusted means of the quiz scores taken under Conditions ONE, TWO, THREE, and FOUR were 7.47, 6.80, 7.01, and 7.34, respectively. The results of the ANCOVA found no significant difference among the groups ($F = .516$, $p = .67$.). The results of the paired t-test found mean post-test scores ($M = 7.14$) were significantly ($t = 3.494$, $p = .001$) higher than pre-test scores ($M = 6.38$).

Table 1: Percent Correct Per Question By Standard and Condition

Question	Arkansas Standard	ONE - Look		TWO - Record		THREE - Chart		FOUR - Sync		All Conditions	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	PEL.3.4.2	29%	71%	31 %	46 %	28%	33%	65%	35 %	39 %	45 %
2	PEL.3.4.3	43%	50%	46 %	54 %	39%	28%	18%	53 %	35 %	45 %
3	D.5.4.1	36%	50%	23 %	54 %	44%	72%	35%	71 %	35 %	63 %
4	CC.9.4.2	71%	64%	77 %	38 %	67%	56%	35%	88 %	61 %	63 %
5	CC.10.4.2	50%	86%	38 %	77 %	72%	89%	71%	82 %	60 %	84 %
6	CGE.12.4.1	79%	86%	85 %	77 %	100 %	94%	94%	94 %	90 %	89 %
7	CGE.12.4.1	86%	71%	69 %	85 %	94%	89%	82%	76 %	84 %	81 %
8	D.4.4.1	71%	71%	85 %	92 %	100 %	94%	94%	94 %	89 %	89 %
9	D.5.4.3	71%	86%	54 %	77 %	83%	100 %	94%	82 %	77 %	87 %

10	D.6.4.1	14%	71%	92 %	92 %	100 %	100 %	100 %	94 %	79 %	90 %

Discussion

As shown in the last two columns of Table 1, the two questions in which students improved the most were questions 3 and 5. The two questions that students performed poorest, questions 1 and 2, were related to physical education standards. Upon reflection, question 1 will be modified to "Which of the following can be used to measure heart rate?" so that the foil, "Taking my pulse from my carotid artery" more directly applies. Also, in physical education class, although we did have the students find their pulse via their carotid artery, we did not have them calculate their heart rate when doing so; we will do this in the future. The information for question 2 was one of the ten fitness facts given to the students on the slips of paper where they wrote their number of steps to take home. From the results of this analysis, it does not seem most students read that "riding a bike" was better suited for "maintaining a moderate to vigorous level of activity" than "sprinting." Unfortunately, since the elementary students in this school district only receive physical education once a week, taking time from their precious physical activity time to discuss the plethora of health and fitness concepts related to physical education is a dilemma and one faced by a majority of physical education teachers.

Conclusions

There was no significant difference in post-test scores among the four conditions. Post-test scores were significantly higher ($p<.025$) than pre-test scores; however, without a control group, it is difficult to know if the improvement was due to maturation, what the students learned in class during the semester, or because this was the second time they had seen the test. It is recommended that a control group be added to future studies.

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Lessons Learned Flipping a Course to Promote Technology Integration: Case of the Flipped, Flopped, then Flipped Performance Based Instructional Design Course

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Abstract

This snapshot case study was designed to document findings regarding the experiences of flipping a traditional field-based course over the period of three semesters. For this iPad required class, pre-service teachers completed a pre-survey on the first day of class and a post survey on the last day of class. Holmberg's theory of interaction grounded this study. A total of 97 pre-service teachers participated in this study. The mixed results show that some pre-service teachers were excited with the flipping of the class, whereas others did not find the use of iPad as helpful because of their majors. In addition, challenges encountered are documented. The lessons learned helped to refine and improve this flipped course.

Introduction

Today's classrooms have changed due to the plethora of technology available to impact student learning. Students learn in different ways and technology is a vital part of their day-to-day lives. Hence, from kindergarten to college, technological devices (iDevices) are being used as part of instruction. iDevices inclusive of iPads have impacted how students learn and acquire the knowledge and skills needed for survival in the 21st Century classroom (Getting Started: Classroom ideas for learning with the iPad, 2011).

The former traditional sage-on-the stage (teacher-centered model) is quickly being replaced by more student-centered approaches with the use of technology. Thus, many classrooms are now experimenting with the flipped or inverted model of providing instruction, with the integration of technology. Research over the last two decades indicates that there are positive gains when teachers utilize digital technologies correctly and creatively in the classroom. There is impact on language acquisition, access to information, support in learning, student motivation and enhanced self-esteem (Boster, Meyer, Roberto, Lindsey, Smith, Strom & Inge, 2004; Mann, Shakeshaft, Becker & Kottkamp, 1998; Tracey & Young, 2006).

That is, when learning is personalized for students including students with disability, there are gains. With the plethora of e-books and other electronic devices available on the market today, it is incumbent on educators to ensure that students are set-up to be successful, by the utilization of the rich and varied experiences technology affords at all levels (O'Hara, Pritchard, 2014). This includes modifying and/or changing from the traditional approach when teaching today's 21st Century students.

Traditionally, instructors taught their course in a face-to-face classroom environment followed by an assignment. The purpose of the assignment was to reinforce what was learned and/or to give students the opportunity to practice needed skills. Now, in the flipped or inverted classroom, generally, the teacher provides the lectures in the form of short videos. Students are expected to interact with and watch the videos before coming to class. Therefore, precious class time can then be used to reinforce concepts introduced in the videos as well as carry out activities and discussions (Mok, 2014) as shown in Figure 1.

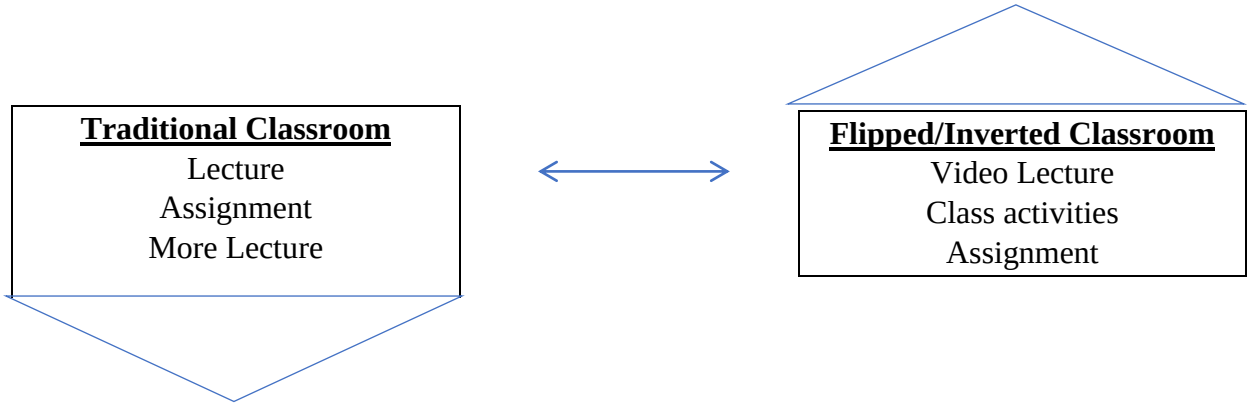

Figure 1: The flipped/inverted classroom

Figure 1 shows the contrast between the activities in the traditional versus the flipped/inverted classroom. From the dawn of the 20th Century the majority of classrooms have looked, felt and operated in the same traditional manner. The teacher is at the center of the room at the chalkboard facing students sometimes and have their backs turned to them at other times. Furthermore, the teacher was the 'only repository' of knowledge, skills and authority. In essence, the teacher was in charge of every aspect of both teaching and learning that happens in the classroom. Therefore, the teacher lectures, gives homework/assignment to students, and then lectures some more. The flipped model turns this traditional lecture notion around, as defined by multiple researchers (Burch & Warren, 2017; Abeysekera & Dawson, 2015; Mok, 2014; Getting Started: Classroom ideas for learning with the iPad, 2011; Lage, Platt & Treglia, 2000).

Defining flipped strategy to learning

This research uses Abeysekera and Dawson's (2015) definition of the flipped/inverted classroom. With this definition, a flipped/inverted classroom is viewed as a set of pedagogical approaches moving active learning to front and center in the classroom, with a strong focus on increasing student engagement, autonomy and student-centeredness. Student engagement is defined as the psychological investment students make in the learning process. The focus is on incorporating and internalizing the knowledge students learned from lectures, and experientially (in and out of the classroom). The proven lecture methodology that has dominated education for centuries, now is challenged by the flipped method, a 21st Century approach to teaching and learning (Buch & Warren, 2017). Teachers work consistently to help their students connect with learning, and flipping the classroom is one strategy that may be useful for helping students to experience behavioral, cognitive and relational engagement (Parsi, 2015). Traditional in-class content (direct instruction) is being replaced with technology led short videos for students to become engaged with the content prior to attending class. This leads to active learning purported by researchers (Braun, Bremser, Duval, Lockwood & White, 2017) as the way to go in post-secondary education. Based on the literature reviewed, the premise taken was that this flipped strategy would be a game changer with regards to how students interact with technology as well as with the course content.

Technology as game changer

Since the start of the 21st Century, technology with specific emphasis on the Internet based technology has become a game changer in the entire society. Other impacts of 21st Century technology in the society include, but is not limited to, social media, Massive On-line Open Courses (MOOC's), one-to-one technology, coding made simple and gaming. Classrooms now have interactive smart boards; technology carts; and multiple iDevices and other mobile technologies in the palm of our students' hands (Galdorisi, 2013). Technology has encouraged instructors to become engaged in 360º degree learning. That is, instructors are 'meeting' students 'outside' the classroom in creative ways beyond the traditional giving of assignments as evidenced in the flipped/inverted classroom approach. This new approach encourages students to interact with the content through video podcast prior to attending class (Braun, Bremser, Duval, Lockwood & White, 2017). When students come to class, most of the class time is designated for collaboration, critical thinking and creative activities. These activities are followed by assignments to reinforce what was learned and experienced. Thus, the traditional practice of teacher-centered focus shifts to a more student-centered learning, using the inverted approach (Buch & Warren, 2017).

Lage, Platt and Treglia (2000) coined the phrase the "inverted classroom" where teachers are encouraged to change how they conduct teaching and learning. In this approach, teachers place students at the center of learning. Learners must do the work prior to attending class, hence, coming in with a knowledge base. This knowledge can be broader than that of the teacher who no longer is the guardian/repository of knowledge. More and more research on the flipped/inverted classroom has shown improved student learning. This has been evidenced in the following areas: better passes in standardized exams and more responsibility placed on students to take more control of their learning (Flipped Learning Network, 2012) when the flipped approach is utilized. (Buch & Warren, 2017) as well as Atteberry (2013) also found positive changes in students' performance based on exposure to a flipped learning environment. Proponents of the flipped/inverted classroom approach foresee students' engagement continuing to improve in and outside the classroom.

This improvement in student engagement has been substantiated by the recent research of Buch and Warren (2017). They flipped their masters level math classroom and found that 60% of their students were highly satisfied and 35% were satisfied with assessment in the flipped classroom. In addition, 58% indicating they were highly satisfied and 33% satisfied that the flipped classroom aided their understanding, due to the engagement outside the classroom. Furthermore, students reported watching on average 95% of the videos prior to attending class, and 84% completed homework prior to class (Buch & Warren, 2017). These results indicate that in this flipped model, students were engaged with the content outside the classroom, leaving room for more collaboration and problem-solving during class time. This is the thrust of the flipped classroom model-more student engagement and understanding.

Purpose

The purpose of this snap-shot case study is to document findings regarding the experiences of flipping/inverting a traditional field-based course to an iPad-required course. The process of flipping the class is outlined in addition to the challenges that resulted in the course FLOPPING. Recovery from the flop also is chronicled. Four years earlier, all freshman students were required to have an iPad for all classes. As these students matriculated to this junior level

class, there was need for the instructor to re-examine the nature and structure of the course to meet the needs of these 21st Century pre-service teachers. Hence, as the instructor of this field-based course, the decision was made to flip this course, so it met the needs of pre-service teachers.

Many of these pre-service teachers complete their field experience in schools having mobile devices such as iPads, Mac books and/or Chrome books. It was imperative that this shift was made not just to have iPads in this course, but, also to flip/invert the class in order to integrate the technology more seamlessly. Furthermore, there would be a continuation for the effective use of and engagement with technology beyond students' freshman and sophomore years. Student engagement is the cornerstone of the relevant theoretical approach by Holmberg, used to anchor this research.

Theoretical underpinning

The selection of Holmberg's (1983) theory of interaction and communication was pertinent as the theoretical underpinning for this case study because of its constructivist approach to learning. The collaboration, communication and interactivity purported by this theory were important because iPad integration in this class is embedded with tons of interactions. These include; student-to student, student to instructor, student to content, instructor to content, student to iPad and instructor to iPad interactions. These interactions form a lattice or web of constant activities that are multi-dimensional. Hence, students are expected to interact with their teachers, with each other and with the content as shown in Figure 2.

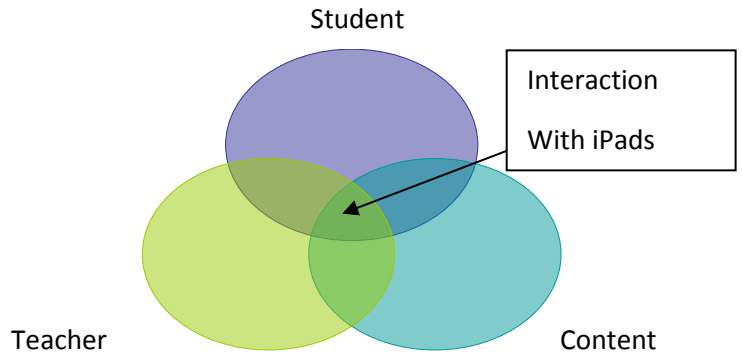

Figure 2: Interactivity in an iPad required class. Adapted from Leslie & Johnson-Leslie (2014)

Figure 2 shows the interaction of students with teachers and the content. The interactions instructor desire from students may not follow the path envisioned in terms of strict adherence. Today's students do forge new and creative ways of becoming engaged in the classroom. Student interactions with content will occur when students become engaged with text in the

various media—be it print or electronic (Moore, 1989). Student-to-student interaction is easily facilitated in today's classroom because technology has provided multiple ways for student to communicate and collaborate with others about the content. Students have access at their fingertips. Features and APPs are abundant for students to pick and choose from anytime, and anywhere. Features such as blogging, e-mail, mobile video streaming for face-to-face electronic conversations, texting, use of Twitter, Instagram, Vine, Vimeo, YouTube, TeacherTube, TEDEd, Google sites and Khan academy (Walsh, Ibrahim & Watts, 2014) help our students interact and connect with each other. Finally, the student teacher communication is facilitated by any means available electronically or face-to-face. Furthermore, students are getting engaged at multiple levels with stakeholders in the teaching and learning environment because of the affordances brought on by technology.

Holmberg indicated that, teaching is indeed the facilitation of student learning. This facilitation comes through constant interactions. Another hallmark of this theory is providing students with interactions that are relevant and capture students' interests, leading to greater learning outcomes. Holmberg recommends that when technology of any form is integrated in the classroom, the following features outlined on Table 1 must be present to enhance learning and engagement.

Table 1: Features to enhance learning and engagement

• Open, clear and flexible communication
• Promotion of creativity among learners
• Encouraging learners to utilize primary sources
• Fostering intellectual curiosity and honesty among learners
• Providing adequate time for digesting of new information
• Giving learners opportunities to work at one's own pace
• Maintaining friendly and personal tone with learners
• Ensuring constant collaborative opportunities to work with others
• Emphasis placed on critical and divergent thinking that facilitates problem solving
• Being engaged emotionally with the content (text-to-self) by appealing to all of the students' sensory modalities (Holmberg Theory Dialogue by 'Holmbergers' 2013).

Table 1 shows selected features that Holmberg (2013) identifies as best practices for enhancing student learning and engagement, when technology is infused in the teaching and learning environment. Thus, Holmberg's Theory is centered on the learner utilizing effective communication as well as learning skills. This personal communication facilitates critical and divergent thinking skills that are of vital importance in a performance-based course. Communication through guided didactic conversation is an essential component of successfully flipping a given college course.

Method

The research design was a snap-shot case study, with the case/unit of analysis being two courses of secondary education pre-service teachers registered for this course requiring mandatory iPad use in the course (Stake, 1995; Yin, 1994). At the first class, pre-service teachers completed a pre-survey comprised of 9 items. Eight of the questions were quantitative Likert-type questions. The final question #9 was an open-response question requiring qualitative response. Pre-service teachers were required to place the last 5 digits of their school's ID number for control purpose only. iPads were used throughout the 16-week semester. At the end of each semester, the pre-service teachers completed the parallel post survey. Prior to data analysis, the pre-and post-surveys were matched based on the last 5 digits of the students' ID number. This process purged the data so that those students who dropped the course or were absent for either the pre or post survey, their response was removed so as not skew the final data. The survey data was analyzed using Excel.

Participants

In the teacher education program students aspiring to become secondary education teachers are required to take 12 hours of education credits as part of this degree program. Pre-service teachers from up to nine different majors take this 5-hour field-based class each semester. The day when registration closes for the following semester, students are sent a welcome letter to the class. In this welcome letter, they are informed this is an iPad-required class. Thus, students can prepare and be ready for this class. Some may have questions such as (1) Is it possible to use another mobile device? (2) Is there an option to rent the iPad; (3) Will I be able to use my scholarship money to purchase the iPad? The instructor answered all these questions as soon as they were raised. Answers were emailed to the entire class so that all students saw the responses. This strategy reduced the need for multiple students asking the same question.

Context

Class instruction was from 8:00 - 9:45 A.M. on Mondays, Wednesdays and Fridays for the first section; and 8:00 - 10:45 A.M. on Tuesdays/Thursdays. Students spent the first 5 weeks of the semester in class only, then starting week 6 they attend their school site for field experience. For the past three years, starting in fall 2015, the class Performance Based Instructional Design became an iPad required class. Thus, secondary education pre-service candidates who were admitted to the teacher education program and registered for this class were required to bring an iPad. In order to flip/invert a course, support, preparation, training, time and dissemination of findings are needed.

First, the department chair supported the justification presented to him for flipping this field-based course. *Second*, the instructor started preparing for the adoption of this new methodology. This included reading the research about flipped/inverted courses. *Third*, the instructor prepared for flipping the class by attending 3 workshops at the Faculty Center in summer 2015. *Fourth*, this training and preparation took time. Finally, dissemination of findings was important, based on the evaluation of the class. There were successes as well as challenges during these three semesters.

Report on findings

Having this field-based class starting at 8:00 A.M., and having the iPads was a great

addition. Based on the class activities, students were required to use their iPad especially in the first five weeks of class. The first assignment required each student to learn and present to the class three or four features of the iPad. Over five-class periods, students presented this information to the class by connecting to the Apple TV in the classroom. Students were able to share their views in terms of additional ways to use the various features of the iPad when their peer presented. In addition, students were expected to do research and find out what was happening in the news regarding education. Students were always searching for the latest news to share with the class. Table 2 shows the number of students taking this class over the three semesters.

Table 2. Participants who registered for class and completed either pre and/or post-surveys

	Fall 2015	Spring 2016	Fall 2016	Total
Section 1	15	17	16	48
Section 2	17	16	14	49
Total	32	35	30	**97**

As shown on Table 2 there was total of 97 students registered for the course who completed either pre-or post-surveys. However, the total number of students completing both pre-and post-surveys was 81 for a completion rate of 83%. The reduction in the number of students was due to attrition. Some students got registered for the class and dropped the course for a variety of reasons. In addition, some students may have added the class late and did not complete the pre-test. All missing data were removed.

The quantitative section (Section 1) of the surveys was divided in three primary parts, each part having five, six, or seven statements. Part 1 addressed students' perceptions of learning with iPads. Statements addressed issues of application, learning, connecting, participating and developing confidence and skills when using iPads. The Likert Scale had six categories (strongly agree, agree, neutral, strongly disagree, disagree and do not know). Based on responses to the surveys the scale was collapsed into three categories (agree, neutral, disagree). Pre-and post-survey results were as follows in Figure 3:

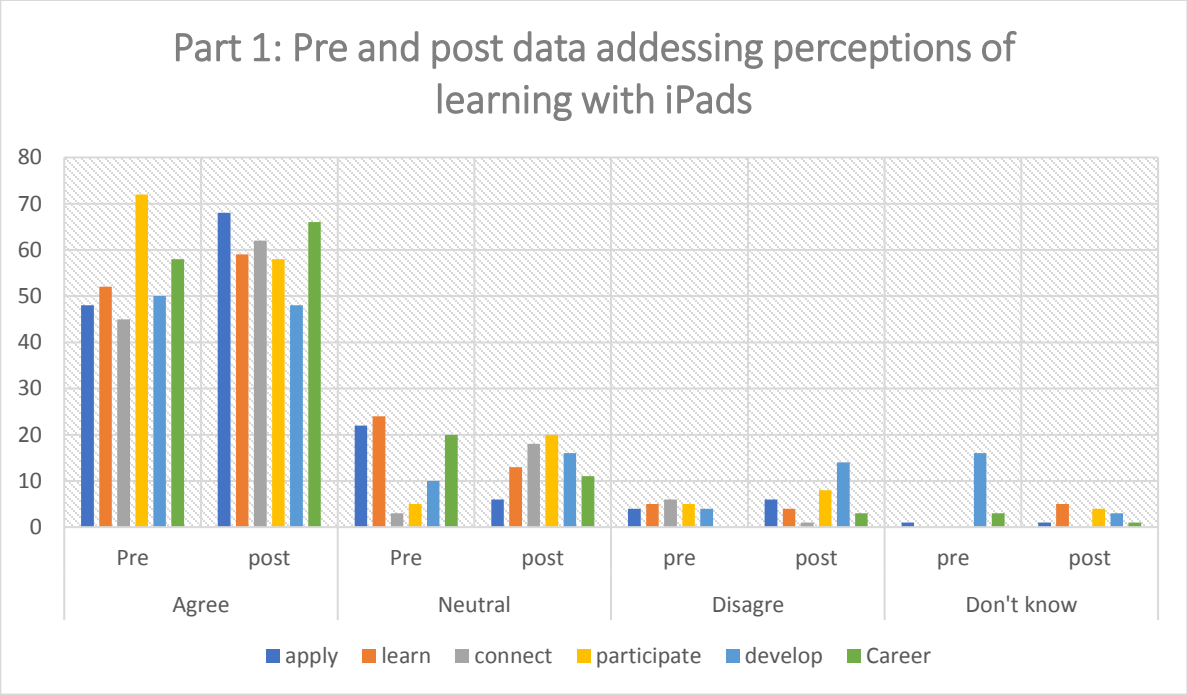

Figure 3: Perceptions about learning with iPads

Figure 3 shows from the pre-survey responses to Part 1, "perceptions about learning with the iPad", students were generally hopeful. Part 1 had six questions related to application, learning, connecting to new ideas, class participation, developing confidence, and applying skills in one's teaching career. In general, there was improvement shown in the increased number of participants answering the post-survey items indicating that they found the iPad as a useful tool in their learning experience. This indicate that students perceived that using iPads in this class helped them. In participation, there was a 17% reduction. There was also a slight reduction in students view on the post survey regarding the development of their confidence in using the iPads. Qualitative responses related to students' perceptions of learning with iPads follow.

> "How to better apply an iPad ad in my class room without being to excessive, but also without under using the technology. I'd want to find the balance for my classroom". How to use the iPad for learning to apply to my students"

> "I hope to learn more about teaching experiences and different types of cues that would help me out in the classroom"

> "How to best use technology to enhance the learning and atmosphere in any future classes I may teach"

> "I hope to figure out which ways an iPad should be used for students to learn the most while remaining engaged in Histories"

Based on the qualitative responses, students indicated hopefulness in learning how to use iPads effectively in the classroom. The quantitative results have corroborated these results showing gains across each item.

Part 2 of the survey addressed perceptions of engagement. There were 5 statements addressing motivation, encouragement, increased attention, collaboration and reduced boredom. Pre and post-survey results are indicated in Figure 4:

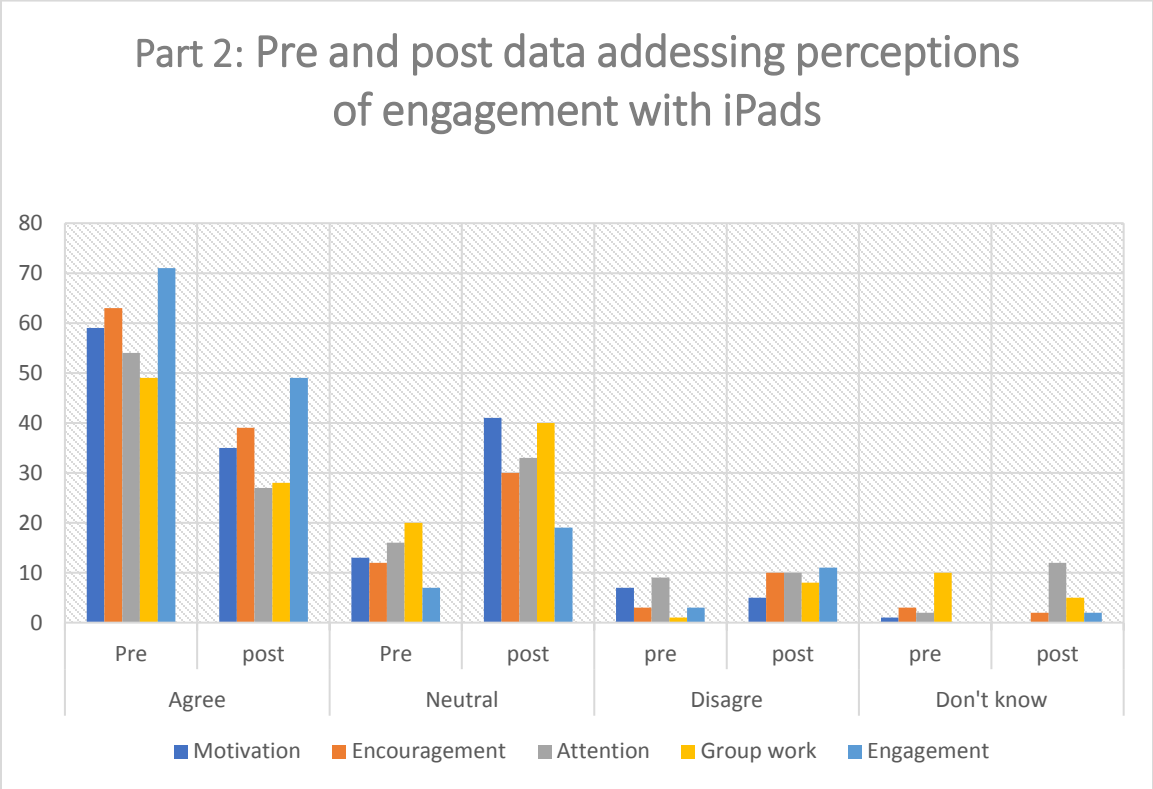

Figure 4: Perceptions of learning with iPads

Again, Figure 4 shows from the pre-survey results that students had high expectations for engagement with the iPads. The post-survey shows a reduction in how students felt about their experience of true engagement with the iPads over the course of the semester. One explanation for such was more students indicated a neutral position regarding engagement on the post-survey. Categorically, there was an uptick in the number of respondents who disagreed about having high engagement with the iPads. Qualitative responses were as follows:

> "Maybe how to utilize teaching networks, apps and other things that would allow for more thorough communication between teachers. What are some good resources? Is this iPad really necessary for the average classroom?"

> "Wish we could have explored resources that could benefit our subject area."

> "I am fairly contented on what I did learn, I hate that I only needed it for one class, but

other than that I think iPads can be positive and negative depending on their use."

"More ways to use the iPad in activities and instruction. Maybe common websites and apps that teachers use. I know that could be difficult with the different areas though."

"I wish we could have explored applications that would be useful as a teacher. I am very unfamiliar with Apple products and do not like tablets, as my phone does almost everything anyways… but I did not use the iPad very much. The video presentation was frustrating because I didn't know how to do it, so I wish I had learned its functionality."

"I wish that we had used our iPad more considering the fact that it was required for this course."

Overall, students indicated there could have been more use and engagement of the iPad over the 16 weeks of the class. During the first 5 weeks of the course, the iPads were used very often. However, as the semester rolled on and students went out to their respective schools, there were fewer uses of the iPad. Students had to discuss their experiences in the schools much more, hence less time was spent utilizing the iPads. An activity used to enhance in-class use of the iPads was having students text their experience to the class instructor. This was not the preferred mode for the instructor because quite often the entire class did not hear the experience of all classmates. However, this frequent texting supplemented student engagement with the technology.

Part 3 of the pre-and post-survey focused on issues that addressed students' attitudes towards (iPads) and mobile technology. Specifically, the issues ranged from wishing for iPads to be used in all classes, providing excitement, feelings of fear, comfort level and monetary investment. Results are as follows as indicated on Figure 5:

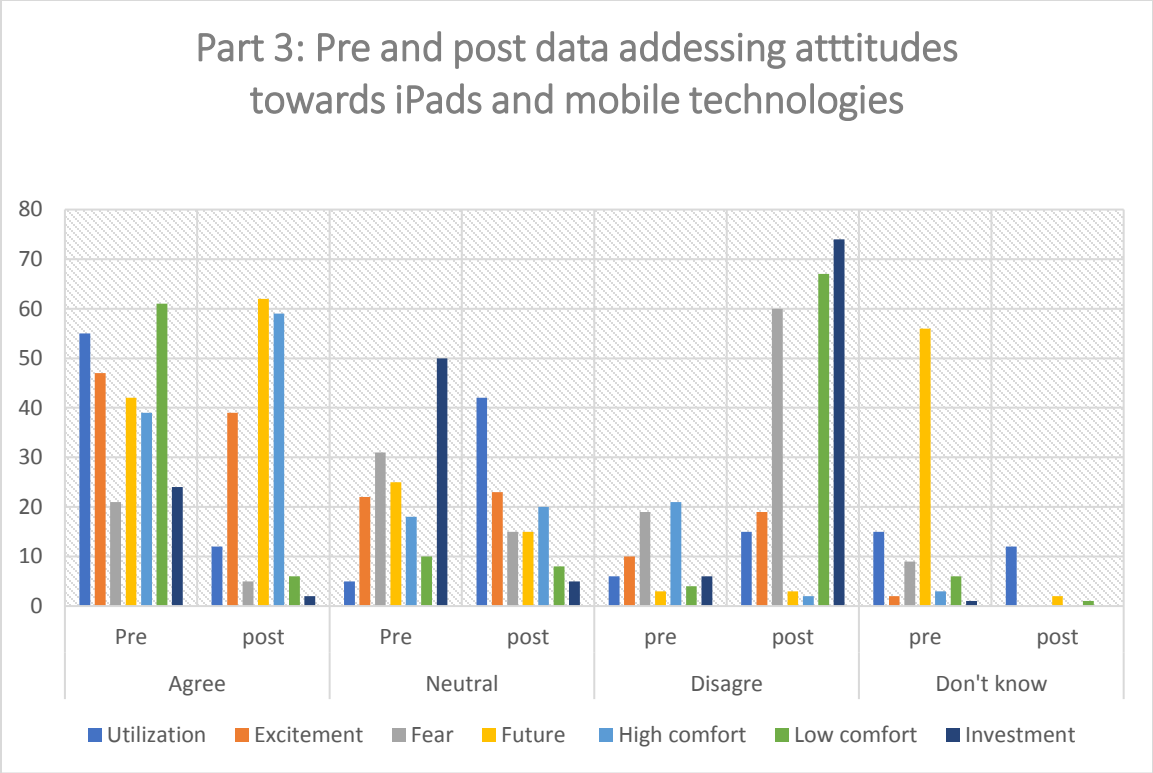

Figure 5: Perceptions about attitudes towards iPads and mobile technologies

Figure 5 suggests that the majority of students in this field-based class over the three semesters were young adults who have access to technology since their early childhood years. Hence, the assumption was these students would all have a positive view about technologies and mobile technologies in general. However, the data showed mixed results. Not all students were gung-ho about mobile technologies. Some indicated feelings of trepidation when they realized the class was an iPad required class. There was some degree of uncomfortableness among some students as well. Open responses to Part 3 are as follows.

> "Having to deal with face to face instruction. Blackboard, and iPad was overly complicated. I like simple and clear methods- too much is not good and distracts from learning. I think if this class is iPad included, then the class should be fully online."

> "Very little done in this class required an iPad- most could be done with any tablet or smart phone- my field didn't use iPad tech at all- iPad brand is too expensive to make mandatory for students to have."

> "I wished I learned more about the iPad. I don't really know anything on the iPad works."

The quotes above show some degree of frustration with this iPad required class. Some students did not see themselves as tech savvy, hence, they preferred the "old school way of teaching and learning. Furthermore, some students had a difficult time because the activities that

were done on the iPad did not translate to their content area. For example, other students shared…

> "…I wish I learned to implement the use of an iPad in the mathematics classroom. I like the idea of the iPad for student engagement. However, I would like to learn some techniques for my content area."

> "Bringing technology into a physical education class was not good. We want kids to get up and play in PE. Not sit with iPads."

> "I hope to better my technology skills and hopefully develop skills that apply to my academic career and life as a professional in music education."

On the other hand, some students from the sample had a positive attitude towards mobile technologies. Ultimately, the goal of preparing pre-service teachers is for them to learn and become effective teachers in the classroom. Technology is just a means of enhancing the learning process. As detailed in the discussions below, there were mixed reviews of using iPads in a flipped classroom setting for pre-service teachers.

Discussion

The Flip: Initially, the instructor was excited about flipping the course due to the fact that students already had iPads, the instructor read several research papers and some training was received regarding how to flip a class. When the students came to class and were introduced to the flipped model many of them were open-minded and willing to try this method. The results of the pre-survey indicate students' initial positive perceptions about utilizing the iPads. Based on the literature reviewed to successfully flip a course there must be access to technology, training on the part of the instructor, and improving one's knowledge base about this flip process (Buch & Warren, 2017; Atteberry, 2013; Flipped Learning Network, 2012; Lage, Patt & Treglia, 2000). These three fundamentals of flipping the course were in place waiting for implementation.

The Flop: The implementation of every major change in today's classroom has benefits and challenges. In this performance-based course, the change to the flipped model has it unique set of challenges. *First*, some students came to the first class upset that the class was now an iPad class. They complained they had to purchase an iPad for the course. This was an unexpected challenge for the instructor. When students were asked about their iPads from their freshman and sophomore years they indicated they sold the iPads because they were not being used after freshman year.

Second, for the first two - three classes, most students watched the short lecture videos and class discussions were spirited in class. When students went out in the field, they started to come to class unprepared because they did not watch the videos. Students complained they were too busy with all the work they had to do as well as to balance their personal lives to watch lecture or assigned videos. When asked about the readings in the text, the responses were similar. According to Mok (2014), "one of the biggest advantages mentioned by students is that they had the option to watch each video lecture as many times as required to be prepared for class" (p.7). Therefore, one of the attractions for flipping a course is for students to come to class prepared. In this flipped model, this became a challenge. This is one way this research differs from other research that did not report experiencing a 'FLOP' with this model. The research shows many

schools have implemented the flipped classroom model with individual successes based on a number of variables (Buch & Warren, 2017).

Third, due to the constant complaints, the instructor resorted to doing many lectures that were interspersed with activities and spirited discussions. Students indicated such a modification made then feel better prepared to take their Principles of Learning and Teaching (PLT) licensing exam when the traditional lectures were conducted. Meeting the needs of learners and listening to their concerns are important in the teaching and learning environment. Therefore, the instructor utilized monitoring and adjusting techniques, thus, learning from the FLOP of the inverted course and improved the course over the next semester. Holmberg's (2013) theory of interaction that grounds this paper indicate, open, clear and flexible communication needed among stakeholders for successful engagement with technology.

The Flip: Finally, with some experience of flipping the course prior, as well as learning from the "flopping" of this course, the instructor set out to design a strategy that fosters positive interaction outlined in Figure 2, where there are synergetic interactions among the students, content, iPad technology and instructor/teacher. Therefore, in the final semester, a deliberate effort was made to utilize best practices in this flipped course.

First, the welcome letter for the course participants were sent out the week immediately following the close of registration. Therefore, students were aware of the requirements earlier. In the welcome letter a justification was included outlining why and how the flipped model, with iPads would be utilized. *Second*, 2 weeks prior to the start of class, students were required to watch a short video clip they are expected to discuss when they came to class. On the first day of class this discussion was facilitated. Students participated very well in such a discussion of the short video clip. Students were told this was the method that would be followed for the course.

Third, the instructor further flipped how the content was presented. The first five-weeks were now very content heavy with a number of short videos to be viewed for class discussions. *Fourth*, when student went out in the field, they had only one short video to view every other class period. This led to more student viewing the short video before class. The instructor observed some students who came to class early using that time to watch the videos. There were times when some students tried to watch the video in class or on the break time before the discussions.

Finally, the personal changes the instructor made with the course itself led to a more successful flipped model. Each instructor may have varying degree of successes as well as challenges. The key is for stakeholders and users to have a clear understanding of the purpose of flipping a course. Buch and Warren's (2017) study indicated that some students were opposed to the flipped model. They indicated that such opposition "had nothing to do with the flipped classroom; rather, they were more focused on the requirement of online homework" (p. 113). This research supports such a finding. Sometimes it not the model per se, but, rather the wholistic picture of all the student has to accomplish that impacts their thoughts, perceptions and feelings about a change in the learning environment.

Conclusion

In the flipped/inverted classroom, the focus was on providing students with content in an engaging and relevant manner. Hence, the interactions postulated by Holmberg's (2013) theory were important. The technology used was a means to an end. In this field-based class the lessons and activities were designed to have students become effective teachers. When students were

asked of their perceptions regarding learning, engagement and usefulness of iPads, the majority did indicate that iPads enriched their learning experience, was engaging and improved their attitude towards mobile technology. However, this flipped method and the use of the iPads was not highly valued for learning by all students.

One of the challenges for students in this flipped/inverted classroom was for them to consistently prepare the pre-class activities prior to attending class. As a result of the lack of preparation, the instructor had to monitor and adjust by sometimes resorting to full lectures (flopping) versus the mini-lectures planned. Students indicated just how difficult it was for them to balance work, family and other obligations with having to do so much outside of class.

Therefore, there were many valuable lessons learned from this snap-shot case study that can help instructors be successful at flipping/inverting their courses. Educators are encouraged not to give up the first time when experimenting with a new teaching strategy, such as the flipped model. Rather, to be persistent, especially when a strategy can be a game changer in enhanced teaching and learning, if implemented correctly. Incremental roll out of the flipped classroom strategy has been found to be most effective (Mok, 2014). Effective implementation of any strategy takes time, energy, practice, sometimes failure, as well as monitoring and adjusting to best meet the needs of learners.

Lessons learned

1. In keeping with the educational clique "monitor and adjust," when flipping a class, one has to implement monitoring and adjusting during the process
2. In general, students learned some useful ideas of how to integrate iPads in their future classrooms
3. Students who went to field placement in a school with one-to-one technology benefited the most from the flipped/inverted approach to teaching
4. Students wanted to integrate the use of the iPads in class much more than they did throughout the semester
5. The iPad usage enhanced the learning experience. For example, students were able to search for current information in real time instruction
6. The iPads were used to access information readily and rapidly. This cut down on the amount of time required for conducting research outside of the class.
7. Using the iPads in class was useful for the students who were in a school where each student had a MacBook Pro, Chrome Book, other Android devices, or iPad. These students learned valuable lessons from their clinical supervisors who were utilizing technology in the classroom first hand
8. Not all students are excited about the use of iPad technology in the classroom
9. Implementation of a few strategies at a time leads to greater success when flipping a course for the first time

Implications and recommendations

1. Flipping a class must be done incrementally
2. Like pancakes, flipping/inverting may not be successful at the first try, but over time paying attention to the best practices of flipping/inverting a course will be beneficial
3. Training of the faulty to use the iPads and to flip/invert a class is important
4. Student in the performance-based subjects (Music, Art, Physical Education) indicated

they did not find the use of iPads in the class very useful, because they had fewer examples that were relevant to their content area. Hence, instructors need to be cognizant of such, and ensure there are relevant examples provided to help these future teachers use technology in their content areas effectively

5. Students liked the portability of accessing their lectures on the iPads
6. Windows based devices were recommended for future use. In addition, some students felt that they could do similar work on their smart phones, Android devices, hence, no need to require iPads
7. iPads, Android devices, and tablets are becoming more and more common on campuses, and in the work place. Instructors must meet students where they are in terms of technology usage
8. Effective pedagogy/teaching cannot be replaced by iPads or any other mobile technology
9. Listening to students' feedback can lead to great improvements in one's flipped classroom

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Revisiting Schools in Need a Decade Later: Using Previous Findings to Solve Current Problems

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Abstract

The purpose of this paper is to review a previous study and compare findings with current literature and research. In the original paper, differences in the perceptions of teachers teaching in high-need areas and teachers not teaching in high-need areas, as defined by the states of Arkansas and Louisiana, regarding higher compensation for high-need teachers were studied. However, in this paper the perceptions of current principals and superintendents are the focus. In the first study, administrators were keenly aware of the impact higher compensation would have on attracting and retaining high-need teachers. The independent variable of focus consisted of position held. The dependent variable was the perceptions of the participants on providing higher compensation for high-need teachers in order to attract and retain them in hard-to-staff schools. The data for all variables, in the first study, were collected using an online survey. The results of this study indicated that principals agreed that higher compensation would attract and retain teachers in hard-to-staff schools, but were not in favor of paying these teachers more. The data for the second study were collected via face-to-face interviews using the same questions used in the original study. The results of this study indicated that administrators continue to view varied salaries to attract and retain high-need teachers in a negative light.

Introduction

Educating America's children has been of primary importance for 200 years. Part of this educational endeavor has been finding and retaining people to teach these students. This has proven to be a daunting task for administrators seeking to hire the best teachers. Most public schools have few problems finding highly-qualified teachers, but some schools consistently have trouble finding and keeping teachers in the high-need areas of math and science (Murphy & DeArmond, 2003). As a result, students, at no fault of their own, find themselves at a disadvantage being taught by teachers who are not qualified. Due to this fact, schools must implement strategies to attract and retain high-need teachers (Hassel, 2002).

According to Sterling (2004), "…well-prepared teachers have the largest impact on effective classroom practice and high student achievement" (p. 7). For too many schools with large percentages of minority students, finding high-need teachers is a tremendous problem. Such schools are unable to attract them and are forced to use under-qualified teachers, which places students at a disadvantage. Sterling also pointed to the fact that, "…experienced teachers… [leave] the profession…due to low salaries and job dissatisfaction" (p. 1).

The foundation of the previous study supported the idea that higher salaries would attract and retain highly-qualified teachers. More specifically, it assumed that higher salaries would attract and retain teachers to fill positions normally filled by under-qualified teachers. This was supported by the work of Goldhaber (2006), who found that higher compensation is effective in attracting and retaining high-need teachers (p. 1).

Student performance is closely related to teacher quality (Salinas & Kritsonis, 2006). Because of this, it is critical for all students to have highly-qualified teachers. Previously conducted research has indicated that many students do not have access to highly-qualified teachers, which has placed them at a disadvantage. Schools with large percentages of high poverty and high-minority students have found difficulty attracting quality teachers (Ingersoll, 2006). Although most schools face occasional problems finding high-need teachers, high poverty and high-minority schools are more likely to face such problems. The problematic issue is when administrators begin the process of recruitment and the effort of retention.

This article presents data of principals' perceptions concerning the use of higher compensation for attracting and retaining high-need teachers. It provides data from a study conducted approximately ten years ago and makes comparisons with a similar study recently conducted. The perceptions of current and former principals were studied.

Both studies were partially based on the works of Linda Darling-Hammond, Richard M. Ingersoll, and on the works of other educational leaders. According to Darling-Hammond (2003), "substantial research evidence suggests that well-prepared, capable teachers have the largest impact on student learning" (p. 7). She went on to say more teachers are leaving the profession than are entering the profession, which has been a problem for almost three decades. Because schools with large percentages of high poverty/minority students have difficulty attracting high-need teachers, children in these schools find their teachers to be under-qualified in many instances (Murphy & DeArmond, 2003).

The single-salary schedule has been used by most U. S. schools as the primary means of teacher compensation for many years. With this type of schedule, consideration is not given to teachers' certification areas (Podgursky, 2002). This structure developed due to the growth of school districts through consolidation and the need to move away from salary negotiations, which created allegations of favoritism between teachers. As a result, many schools are guaranteed teacher shortages by field of study (p. 3-4).

According to Feng (2009), "one obvious factor affecting decisions to change employers or occupations is the potential for increasing one's salary. The lower a teacher's current salary, the more likely it is that the teacher will move" (p. 1169). Financial incentives are considered important by most teachers, but are especially important to teachers working in hard-to-staff schools (Greenlee & Brown, 2009). The previous and current studies provided data to help the reader gain a better understanding of how principals and superintendents perceive higher compensation for teachers serving in high-need academic areas. The results of both studies provided insight to the plausibility of reforming the teacher-compensation structure.

Method

Participants

The population consisted of principals and former principals at public high schools in south Arkansas and parishes of north Louisiana. The sample included 29 principals in the original study and nine principals/superintendents in the current study. Only administrators in Arkansas were surveyed in the second study.

Procedure

The design of this study consisted of collecting data using a principal survey. The survey, in the original study, was created and administered electronically via *Survey Monkey*. The data collected in the second study were obtained through phone interviews and email.

Results

According to Barth and Nitta (2008), "…each additional dollar spent on more highly qualified teachers had a larger impact on student achievement than any other use of school funds" (p. 15). Nevertheless, do principals and teachers really want the best teachers or just the perception of the best teachers? There is no doubt that most administrators and teachers want the best for their students. However, in research conducted by Longing (2009), their actions may not show support for having the best high-need teachers. The results of the data indicated that math and science teachers and principals had similar perceptions regarding salaries and other incentives for attracting and retaining high-need teachers in hard-to-staff schools. More than 92% of math and science teachers and over 90% of principals understood that higher salaries are essential for attracting and retaining high-need teachers in schools where the working conditions are challenging. However, teachers not considered high-need did not agree with paying higher salaries to high-need teachers even though over 83% of them agreed that higher compensation would attract and retain highly-qualified teachers to the classroom. Based on research conducted by Darling-Hammond (1999), "…the percentage of teachers with full certification and a major in the field is a more powerful predictor of student achievement…the effects of well-prepared teachers on student achievement can be stronger than the influences of student background factors, such as poverty, language background, and minority status" (p. 38-39).

It was evident that the majority of principals agreed that higher salaries would be an effective way to attract and retain teachers. In research conducted by Farkas et al. (2000), 94% of school administrators agreed that increasing teacher salaries would be an effective way to improve teacher quality, but they also seemed to understand the need for caution when implementing such pay plans. According to Yarbrough (2005), compensation plans that are not implemented appropriately cultivate an atmosphere of resentment among some teachers. In research conducted by Falk, Kosse, Menrath, et.al. (2016), "a large and growing body of evidence suggests that fairness perceptions play an important role in labor relations, affecting work morale, effort provision and market efficiency" (p. 2). They went on to say that pay, considered unfair, caused adverse health conditions, specifically problems with cardiovascular health.

When considering professional relationships between teachers regarding the implementation of variable compensation based on certification/college major, the majority of teachers in all areas and the majority of principals agreed concerning professional relationships. Sixty-one percent (51) of math and science teachers, 66% (66) of teachers in other high-need areas, 85% (105) of teachers not in high-need areas, and 86% (25) of principals agreed that professional relationships would be damaged if school districts implemented variable compensation based on certification and/or college major. Although principals agreed that higher compensation would attract and retain high-need teachers in hard-to-staff schools, 66% (19) of the principals surveyed would not favor working in districts that varied compensation.

So what does the data indicate concerning perceptions of principals and former principals today? Based on the current research, 100% of the respondents agreed that high salaries would attract and retain high-need teachers. However, 89% did not agree with compensating high-need teachers more than teachers not considered high-need. They all pointed to the importance of the school's culture and the importance of maintaining harmony between teachers. Quoting one administrator, "all [teaching] jobs are hard…and it is hard to justify paying one teacher more

than another." Another administrator said, "…we are in the same boat together….I think that it would hurt teacher morale to pay higher salaries to high-need teachers." Although additional research should be conducted, it is evident that most administrators are not in favor of varied compensation for teachers. As a result, many students will be hurt by not being taught by highly-qualified teachers.

With $40,000 being the average starting salary for teachers, many math and science majors can earn twice that much, if not more (Johnson, 2018). Johnson also went on to state that perceptions regarding higher pay for high-need teachers are important for school leaders because they set the school climate, they should not turn a "blind eye" to the need for highly-qualified teachers in the classroom. Some states such as New Mexico are attempting to improve student learning by paying higher salaries to teachers in hard-to-staff subjects (p. 8). If successful, their program could serve as a template for other states that are considering such actions for improvement.

Discussion

Little peer-reviewed research has been done regarding the recruitment and retention of high-need teachers (Ingersoll, 2011). As a result, school leaders should approach modifying salary schedules with caution (Goldhaber, 2006). However, they should also keep in mind the advantages for recruiting and retaining highly-qualified teachers (Barth & Nitta, 2008). In the short term, the need continues to be great and in the long term, the need may be even greater with an improved economy. It is probable that supply will fall further below demand in the areas of math and science, and continue the debate for compensating high-need teachers more for years to come.

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Learner-Centered Reading Instruction

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Abstract

Learner-centered reading is frequently underrepresented in novice, K-5 teachers' classrooms. When learner-centered reading instruction is not used, students are less motivated to learn and less likely to become proficient readers. The purpose of this bounded qualitative case study was to explore novice, K-5 reading teachers' perspectives of learner-centered reading instruction and how they taught a comprehensive reading curriculum in their classrooms. Participants identified that they were unprepared to implement learner-centered reading instruction and did not feel they had time to collaborate and plan learner-centered instructional lessons. Participants would benefit from built in collaboration time as well as targeted professional development over learner-centered reading instruction. These results can inform district administrators of the support needed for novice teachers when implementing learner-centered reading instruction.

Introduction

Researchers have shown that the use of learner-centered instructional strategies when teaching a comprehensive reading curriculum increases student engagement and student success in reading (Richards & Rodgers, 2014; Roehl, Reddy, & Shannon, 2013). Learner-centered instruction encourages deep understanding of the content being taught and results in students who are more engaged in the classroom (Dole, Bloom, & Kowalske, 2016). Similarly, when learner-centered instruction is not used in the classroom, students are less motivated to learn and less likely to progress to become proficient readers (Goodwin et al., 2014). Learner-centered instruction is based on five principles: (a) teacher facilitation of learning, (b) teacher-student shared decision making, (c) use of content to build knowledge and skills, (d) student responsibility for learning, and (e) multiple approaches to evaluation (Weimer, 2013). Students in learner-centered classrooms are also provided with opportunities to participate in their own education, which increases their motivation to learn (Roehl, Reddy, & Shannon, 2013).

While the importance of learner-centered reading instruction has been established, it is common for novice teachers to forgo learner-centered instruction and to rely on existing pedagogical strategies that revolve around teacher-centered instructional methods (DuFour & Marzano, 2015; Goodwin et al., 2014). Novice teachers often implement teaching strategies that are familiar to them, and they often have a preconceived idea that teacher-centered instruction is a tried and true strategy (Dole et al., 2016). Based on this existing research, this case study examines the following question:

What are novice, K-5 reading teachers' perspectives of learner-centered instructional strategies when teaching a comprehensive reading curriculum?

Relevant Literature

Learner-centered instruction provides benefits for many different types of learners (Weimer, 2013). One benefit is that teachers' lessons are based on students' experiences,

interests, suggestions, or input (Weimer, 2013). Additionally, opportunities that allow students to choose activities are based on their personal learning needs (Weimer, 2013). According to Weimer (2013), learner-centered instruction should be based on the following five strategies:

1. Teacher facilitation of learning. Teachers do less of the teaching and telling, instead promoting student learning and discovery.
2. Teacher-student shared decision-making. Teachers allow students to have some control over their learning, which increases student motivation and enthusiasm.
3. Use of content to build knowledge and skills. Teachers use the content from the curriculum to build students' knowledge, skill, and ability to transfer knowledge to other settings.
4. Student responsibility for learning. Teachers create an environment that recognizes the uniqueness of each learner and promotes intrinsic motivation for learning.
5. Considering the purpose for evaluation. Teachers focus on learning and not on testing. Feedback should be detailed and promote growth. Different types of assessments and evaluations should be used, including the opportunity for self and peer evaluation.

Traditional reading instruction consists of teachers using direct instructional methods and the same materials and texts for all students in the classroom. Teachers use very limited flexibility and adjustments in terms of reading content and tasks assigned to students (Mason, 2013). Additionally, in traditional reading instruction, the focus is on whole group instruction and automaticity in reading, and there is very little focus on comprehension, student choice, facilitation of learning, or diversity in learning (Lerkkanen, Kiuru, Pakarinen, Poikkeus, Rasku-Puttonen, Siekkinen, & Nurmi, 2016). Often, the focus of traditional reading instruction is to increase standardized test scores in the areas of vocabulary and comprehension, and the instruction does not consider the importance of reading to construct meaning (Tang, Kikas, Pakarinen, Lerkkanen, Muotka, & Nurmi, 2017).

Many studies question the effectiveness of these traditional methods and underscore the learner-centered method. A study by Lerkkanen et al. (2016) examined to what extent learner-centered versus teacher-centered instruction predicted the development of children's reading skills in early elementary school. They found that students who received learner-centered instruction had better reading skills, and the use of learner-centered instruction was equally beneficial to students from varying developmental backgrounds (Lerkkanen et al., 2016). Additionally, in a study that examined teacher-centered and learner-centered methods to teach a reading curriculum, researchers found that students who received learner-centered instruction showed the greatest gains and had the most-developed reading skills (Tang et al, 2017). Students in a middle school reading classroom who were allowed to participate in the instructional decision-making process when receiving vocabulary instruction had an increase in both self-confidence and motivation (Lehmann & Weimer, 2016).

Furthermore, learner-centered reading instruction can benefit all students in the classroom, for both struggling and advanced readers (Ghahari & Basanjideh, 2017). Moon, Wold, and Francom (2017) conducted a study in which fifth grade students were allowed to use iPads to work on comprehension skills. Students who participated in the study reported that they were excited about learning and found reading enjoyable. Additionally, researchers found a significant increase in comprehension skills among struggling readers in the classroom.

Research Design

The purpose of this qualitative study was to explore novice, K-5 teachers' perspectives of learner-centered instruction when teaching reading. The research question proposed was: What are novice, K-5 reading teachers' perspectives of learner-centered instructional strategies when teaching a comprehensive reading curriculum?

Case study is the qualitative research design used in this study. A case study should be used when the researcher is studying a phenomenon within a bounded system and when the goal is to explore a program, event, or person(s) to gain in-depth understanding through collection of data in a natural setting (Yin, 2014). The case study design was chosen because the goal of this study was an in-depth understanding of instructional practices of novice teachers who teach at a single site. By selecting a qualitative case study design, depth will be added to the phenomenon that is being studied in order to increase understanding (see Yin, 2017)

Participants

A total of ten novice K-5 teachers participated in this study (see Table 1). Participants for this study met three criteria: (a) a K-5 teacher, (b) a reading teacher, and (c) a novice teacher with 0 to 5 years of experience. A novice teacher is defined as a teacher who has taught for less than 5 years (Simpson, 2016). Participants included one kindergarten teacher, two first grade teachers, two second grade teachers, two third grade teachers, two fourth grade teachers, and one fifth grade teacher.

Table 1. Participants

	Number of Years Teaching	Grade Taught
Participant 1	3	Kindergarten
Participant 2	2	1st Grade
Participant 3	4	1st Grade
Participant 4	3	2nd Grade
Participant 5	2	2nd Grade
Participant 6	3	3rd Grade
Participant 7	2	3rd Grade
Participant 8	2	4th Grade
Participant 9	1	4th Grade
Participant 10	4	5th Grade

Data Collection Methods

In this study, data collection was in the form of one-on-one participant interviews. The use of interview allowed the collection of unrestricted information from participants regarding the research questions (see Creswell, 2012). Individual participants were each interviewed one time for approximately 45 to 60 minutes in a 2-week time frame. The interviews were conducted in a semi-structured format to allow for additional information to be gained through supplemental or probing questions after the initial question had been asked (see Lodico, Spaulding, & Voegtle, 2010). Data gathered during the semi-structured interview process were audio recorded to ensure accuracy of reporting participants' responses.

Data Analysis

Open and axial coding were used to identify central ideas that emerged from the interview data through the framework of learner-centered instruction. Open coding was began by manually highlighting words and phrases that reoccurred throughout the interview transcripts. There were 20 common labels and terms that became open codes that were based on the interview transcripts (see Appendix D). Common words and phrases were highlighted with specific colors to group them into categories. After the text was reduced to open codes, the next step was axial coding. During axial coding, commonalities were looked for among the identified codes and codes were grouped into categories to create temporary themes related to novice teachers' perspectives of learner-centered instructional strategies when teaching reading. Thematic coding was then used to identify patterns and relationships among the temporary themes. The following themes revealed concepts related to teacher perspectives of learner-centered reading instruction:

1. Knowledge of learner-centered instruction;
2. Preparedness to teach learner-centered reading instruction; and
3. Time.

Theme 1: Knowledge of Learner-Centered Instruction

A teacher's level of understanding about a concept affects their performance in creating an outcome, so it was important to understand if novice, K-5 reading teachers understood and defined learner-centered instruction. All participants defined learner-centered instructional strategies. For example, T5 commented, "Learner-centered instruction is when students lead the instruction and the teacher serves as the facilitator in the classroom." Additionally, T8 commented, "In learner-centered instruction, students have a voice in the classroom and help to lead and take charge of their own learning. The teacher should facilitate discussion, allow students to have choice, and assessment should be authentic."

In addition to defining what learner-centered instruction entails, participants understood the benefits of learner-centered instruction. The use of learner-centered instructional strategies encourages deep understanding of the content being taught and leads to students who are more engaged and motivated in the classroom (Dole, Bloom, & Kowalske, 2016). T4 stated, "When a teacher uses learner-centered instruction, students are more likely to participate in the lesson meaning they will better understand the material that is being taught." Not only did participants understand the overall benefits of learner-centered instruction, they also tied the benefits specifically to reading instruction. The use of learner-centered instructional strategies to teach reading results in students who are more engaged in the classroom, are more motivated learners, and have better attitudes toward reading (Bradford, Mowder, & Bohte, 2016; Cudney & Ezzell, 2017; Kashef, Pandia, and Khameneh, 2014). T1 commented, "The benefits when teaching reading would be the same as what they are overall, right? Students are more involved in the lesson and they understand the lesson better than if it was teacher-centered."

Theme 2: Preparedness to Teach Learner-Centered Reading Instruction

How prepared teachers feel to teach a strategy is an important consideration when measuring their perspectives, so it was necessary to determine if participants felt prepared to teach learner-centered instruction when teaching a comprehensive reading curriculum. While participants acknowledged that they participated in the professional development that the district offered regarding learner-centered reading instruction, they felt unprepared to implement learner-centered reading instruction in their own classroom. T1 stated, "The training was a great

overview of learner-centered instruction in general, but I still felt unprepared to put it into place when I got to my own classroom." In addition, participants stated that the training was too broad because it tried to cover all aspects of learner-centered instruction instead of focusing on one or two aspects. For example, T10 stated, "The training threw so much information at us that it made me feel overwhelmed. There were too many things being said, and too much that we were expected to go back and do. It would be helpful if I could first learn to be a facilitator in the classroom and then learn about everything else that is involved."

Furthermore, T6 commented, "I am not confident in preparing lessons in which I am the facilitator in the classroom, and I feel like this has become a barrier for me. I understand how important this is for students, but I don't feel like I am ready to do it. I don't feel ready to use learner-centered instruction until I am comfortable being a facilitator in my classroom."

Participants would feel more confident in planning learner-centered lessons to teach a comprehensive reading curriculum if professional development covered learner-centered reading instruction instead of just learner-centered instruction in general. For example, T3 said, "The professional development that was offered by the district covered learner-centered instruction, but most of it used math lessons as an example. I didn't find this helpful in using learner-centered instruction to teach reading." T2 stated, "I really felt like the training we received focused on using learner-centered instruction for math. I get that it's important to teach reading too, but it would be nice to see some examples of that as well."

Theme 3: Time

One of the biggest obstacles participants faced in using learner-centered reading instruction to teach a comprehensive reading curriculum was lack of time to create the lessons and to collaborate with colleagues. Participants would be more confident and prepared to use learner-centered instruction to teach a comprehensive reading curriculum if they had time to plan lessons and to work with colleagues when planning them. Participants desired help in planning learner-centered reading lessons especially when it came to facilitative teaching. For example, T5 said, "I already have so much to do each day, and planning learner-centered reading lessons takes a lot of time. I would love to start using learner-centered instruction when I teach reading, and I would love to be a facilitator in my classroom, but I need time to plan the lessons, and I need someone to help me get started on planning them." T3 stated, "The biggest obstacle for me is finding the time to plan learner-centered instruction. If I could have time to plan with other teachers, or even with the literacy coach, then maybe I would be able to start using it more in my classroom." Additionally, T6 stated, "My biggest obstacle is planning lessons where I am facilitating the lesson instead of leading it. I need help to plan those lessons."

Outcomes

To successfully implement learner-centered teaching strategies into reading instruction, participants identified that they need to feel prepared to use learner-centered instructional strategies. Participants noted that they would benefit from targeted professional development that focused on one learner-centered strategy such as that of facilitative teaching. Additionally, Participants desired adequate time to collaborate with colleagues and plan learner-centered reading lessons.

While participants shared positive views of the benefits and importance of using learner-centered instructional strategies, they would be more prepared to implement learner-centered reading instruction if they were provided with targeted professional development that focused on

learner-centered reading instruction While participants had previously received professional development in learner-centered instruction, the professional development was broad and was not specifically tied to reading instruction. In addition, the previous professional development covered all aspects of learner-centered instruction, which left participants feeling overwhelmed. Participants also stated that they desired planning and collaboration time as part of the professional development. In the past, participants had not been given time to plan learner-centered reading instruction.

Implications

For novice teachers to be successful in implementing learner-centered reading instruction, they need appropriate training and time for planning. Professional development that is specific to learner-centered reading instruction, and focused on just one strategy, could help prepare them to implement learner-centered instruction into their teaching of a comprehensive reading curriculum. It would be beneficial to conduct continuous research on sustaining learner-centered reading instruction in K to 5 classrooms. Additionally, once novice teachers begin implementing learner-centered reading instruction, further research could involve exploring the effectiveness of learner-centered reading instruction in K to 5 classrooms. Additional research could also be conducted on teacher confidence when implementing learner-centered instruction.

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