Towards a Practice-Based Teacher Preparation Approach in Special Education

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Abstract

Recent research demonstrates that teachers who graduate from education programs with a robust, mentored, practice component produce better learning outcomes for their students than teachers who do not. In this paper, we examine one approach to practice-based teacher preparation (PBTP) within an introductory course on disability and special education for pre-service general education teachers. We seek to expand the research base by employing the constructs of Opportunities to Learn (OTL) and the flipped classroom as a means to increase opportunities for practice within teacher preparation. Moreover, we will use these constructs within an overarching framework for inclusive education. Implications for PBTP within special education will be discussed.

*Keywords: practice-based teacher preparation, flipped classroom, special education, pre-service teacher attitudes, inclusion*

Towards a Practice Based Teacher Preparation Approach in Special Education

Scholars in the area of teacher education advocate for centering practice at the core of teacher preparation (Ball & Forzani, 2009; Grossman, Compton, Igra, Ronfeldt, Shahan, & Williamson, 2009; Lampert et al., 2013; McDonald, Kazemi, & Kavanagh, 2013; Pella; 2015; Reid, 2011). Rather than a singular approach, practice-based teacher preparation (PBTP) encompasses a wide number of instructional designs such as lesson study teams, book study, or school-based professional learning communities (Pella, 2015). However, the common thread around PBTP is a “systematic focus on developing teacher candidates’ abilities to successfully enact high-leverage practices” (Zeichner, 2012, p. 378). The rationale for this approach is that by creating stronger linkages between theory and the work of teaching itself, teacher preparation programs will prepare teachers with the pedagogical skills to effectively achieve ambitious learning goals with all students (Forzani, 2014). Recent research demonstrates that teachers who graduate from education programs with an extensive, mentored, practice component produce better learning outcomes for their students than teachers who do not (Darling-Hammond & Wei, 2009). In this paper, we examine one approach to PBTP within an introductory course on disability and special education for pre-service general education teachers. We seek to expand the research base by employing the constructs of Opportunities to Learn (OTL) and the flipped classroom as a means to increase opportunities for practice within teacher preparation. Moreover, we will use these constructs within an overarching framework for inclusive education. In this section, we will provide an overview of current trends in PBTP as well as discuss the potential barriers to widespread adoption in teacher education.

**Overview of Practice-Based Teacher Preparation**

The notion of practice is hardly new in teacher preparation (Zeichner, 2012), but teacher educators throughout different eras have taken practice up in multiple ways (Forzani, 2014). According to the National Council for Accreditation of Teacher Education Blue Ribbon Panel Report (2010), teacher education should be restructured to foreground clinical practice. Indeed, robust clinical practice experiences are necessary for pre-service teacher to situate theoretical knowledge within classroom contexts (Darling-Hammond & Wei, 2009). However, merely increasing the length of time in the field for pre-service teachers without thoughtful attention to the overall programmatic structure has the potential to be highly symbolic rather than meaningful (McDonald et al., 2014). Moreover, clinical practice in isolation provides no impetus for change in the way that teacher educators interact with pre-service teachers (Kazemi, Ghousseini, Cundar, & Turrou, 2015). For this reason, developments in the area of PBTP recommend that in addition to clinical experience, teacher preparation programs center their work around a set of core practices that all teachers must be able to execute efficiently and effectively before they enter the classroom (Ball & Forzani, 2009).

The core practices approach, also called high-leverage practices (Ball & Forzani, 2009), stems from the growing demand placed on teacher preparation programs to prepare teachers who can design learning experiences that support all students in achieving ambitious learning goals (Forzani, 2014). It centers on a set of core teaching practices considered essential to successful instruction but of appropriate grain size (Ball & Forzani, 2011). In other words, it should be specific but not too granular so that it cannot be decomposed for the purposes of reflection. For example, leading whole class discussion is a core practice, while strategies for calling on students are embedded within the overarching core practice. Reid (2011) likens the core practices approach to a game of professional tennis. The core skills of tennis such as the serve, lob, or backhand, get practiced over and over again so that they become routine and automatic. When the tennis player enters the field of play, he or she can focus on the moves of the opponent and take advantage of the affordances of the game rather than expending precious cognitive energy on mastering the basic tennis skills. To extend this metaphor to teaching, the core practices approach prepares teachers for pedagogical adaptation in the face of uncertainty within the classroom context.

This type of adaptive performance requires not only the opportunity for repeated practice but also the ability to innovate in multiple complex domains (Lampert et al., 2013). Indeed, the act of teaching is increasingly complex. Teachers are consistently challenged to serve students representing a broad array of abilities, socioeconomic statuses, races, and cultural backgrounds (Darling-Hammond, 2006). For this reason, teachers should be prepared in a range of practices that they can use nimbly to accomplish their goals with different students in varied contexts. The ability to make these pedagogical shifts will require multiple and rich opportunities to engage in pedagogical reasoning and action through practice-based preparation (Pella, 2015). The core practices approach embraces the uncertainty, paradoxes, and messiness of teaching. Rather than considering the teacher as the sole imparter of knowledge, it views teaching as interactive work between teachers and students where student ideas serve as a resource that influences instruction (Forzani, 2014). Lampert and colleagues (2013) describes students as sense-makers in the core practices approach who engage in the serious intellectual activity with teachers driving together towards rigorous learning goals. Furthermore, the teaching of core practices takes on a scaffolded approach to build pre-service teachers’ capacity for adaptation. Teacher educators initially seek practice opportunities for pre-service teachers within the safe environment of the university classroom before encountering students (Grossman et al., 2009). This way, the pre-service can focus on the core practices at first with a reduced level of risk and complexity. Lampert and colleagues (2013) use the method of public rehearsal to allow for repeated practice of core practices by pre-service teachers. Pre-service teachers preform this method publically with carefully designed instructional activities. Importantly, the rehearsal must be integrated with reflection that engages the teacher educator and fellow students. This way, teachers begin to view practice as an aesthetic exercise with the explicit purpose of being reviewed and analyzed (Reid, 2011). The core practices approach reflects the demands of a diverse landscape in 21st century teaching where teachers not only need to understand the foundations of effective pedagogy but also how to apply them in varied contexts.

**Barriers to Widespread Adoption**

Given the potential benefits of PBTP, it is surprising that teacher preparation programs in general are reluctant to embrace PBTP. In fact, most programs remain largely disconnected from the context of teaching (Ball & Forzani, 2009). The resistance to PBTP stems from the widely held assumption that the act of teaching is natural or instinctual. Therefore, it is assumed that it can be mastered primarily through on-the-job improvisation. For example, Grossman and her colleagues (2009) explain that building and maintaining professional relationships is assumed to be natural rather than learned skill. She argues that it is unrealistic to expect individuals who are socially adept to effectively collaborate with their colleagues, particularly in a field as multifaceted as teaching. These assumptions are also held by the pre-service teachers. Pre-service teachers come with pre-conceived notions about teaching and learning constructed through their own educational experiences (Reid, 2011). Thus, it can be difficult to convince them that teaching, although a seemingly familiar script, is not something that they already know how to do. Rather, it must be refined through reflection and scaffolded opportunities for practice. This can be accomplished by designing learning spaces that feel uncomfortable and novel to pre-service teachers so that they see repeated practice as something worthy of further study. Widespread adoption of PBTP will require a substantial shift in the way that teacher educators, university administrators, pre-service teachers, as well as society at large perceive teaching.

One barrier to the adoption of PBTP is an underdeveloped knowledge base around sophisticated approaches (Ball & Forzani, 2009; Grossman, et al., 2009; Pella, 2015). This paper seeks to contribute the knowledge base on practice-based teacher preparation by exploring the flipped classroom as a practice-based model to increase pre-service teachers’ opportunities to learn. Moreover, there has been limited research around core practices and PBTP within special education teacher preparation (McLeskey & Brownell, 2015). The course described in this study is an introductory special education course for general educators. We seek to add to the literature base by providing an example of how PBTP can be applied to special education. The core practices for special education that we identified in our course include: (a) facilitating inclusion, (b) planning instruction, (c) using individualized educational plans, (d) implementing instruction, and (e) enacting disability law. Our study addressed three research questions in the initial analysis of the data: (a) What is the effect of the flipped classroom instructional model on students’ knowledge acquisition of core practices?; (b) What is the effect of the flipped classroom instructional model on students’ ability to apply core practices for exceptional students in their lesson planning?; and (c) What is the effect of the flipped classroom instructional model on students’ attitudes towards inclusion and collaboration? In doing so, we hope to contribute to the literature around creative approaches to PBTP in order to prepare teachers to use effective teaching practices to serve a diverse range of learners. In the next section we will describe the constructs we used to design a 16-week, undergraduate course with these goals in mind.

**Course (Re)Design**

 Our purpose in (re)designing the introductory special education course was twofold. First, we sought to increase pre-service teachers opportunities to engage in practice-based activities during class meetings. To accomplish this goal, we drew on the construct of opportunities to learn and situated it within a flipped classroom instructional model. This represented a major shift from traditional lecture format typically used for the course. Second, we endeavored to situate the course within an explicit overarching framework for inclusion. While previous iterations of the course promoted inclusive practices, our framework expanded the notion of inclusion to incorporate multiple forms of difference as they intersect with disability as well as a critical analysis of educational inequity. This section will explain how we took up these constructs within the new design of the course.

**Opportunities to Learn**

The scholarship around OTL defines the framework in several ways. Definitions of OTL vary from simply “opportunities which schools provide students to learn what is expected of them” (Herman, Klein, &, Abedi, 2000, p. 16) to more nuanced definitions that analyze t2he degree to which teachers and schools provide the cultural tools that constrain or afford instructional engagement (Gee, 2008; Aguirre-Munoz, & Amabisca, 2010; Griffin, Allen, Kimura-Walsh, & Yamamura, 2007). For the purposes of this study and course design, we primarily drew from the definition offered by Kurz (2011), who states that OTL represents, “…the degree to which a teacher dedicates instructional time and content coverage to the intended curriculum objectives emphasizing high-order cognitive processes, evidence-based practices, and alternative grouping formats” (p. 113). This definition of OTL in the re-design of the course was most suited for our goals of redesigning a single teacher education course for increased opportunities for practice.

While originally developed for use in PK-12 schools, we applied the multidimensional OTL framework in the context of teacher education. The three dimensions of OTL include time, content, and quality. Working from the definition of OTL described above, in this study we focused on the dimension of quality which can be understood in terms of three sub-dimensions: cognitive processes, core instructional practices, and grouping formats (Elliott, Roach & Kurz, 2014). We derived our modified operational indices for each of these dimensions from the five core practices of special education that drove the direction of the course: (a) facilitating inclusion, (b) planning instruction, (c) using individualized educational plans, (d) implementing instruction, and (e) enacting disability law.

Working from a definition of OTL that includes attention to cognitive processes, we increased the quality of our instruction by providing instructional activities that scaled the hierarchy of Bloom’s Taxonomy (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956). While we strove to achieve balance between the levels of cognitive processes, we also focused on maximizing activities that challenged students at the highest levels of the taxonomy. We utilized a wide variety of instructional practices and grouping formats that allowed for increased engagement and student ownership. Some of these activities included TeachLivE teaching simulations, Japanese lesson study, case study analysis, fishbowl discussions, and jigsaw discussions amongst others. Furthermore, the grouping formats of these activities ranged from dyads, small groups of five to six students and whole class student driven activities such as debates. In sum, we used the OTL framework to design a class marked by variety, engagement, and challenging instruction geared toward opportunities to practice.

**Flipped Classroom Model**

In order to increase pre-service teacher OTL, we used a flipped classroom instructional model. Flipped classrooms change the use of classroom time by forgoing traditional lecture in order to increase student engagement and autonomy (Abeysekera & Dawson, 2015). A flipped classroom model emphasizes active learning, peer learning, and collective problem solving. Additionally, students’ time outside of class is restructured to cover activities or material traditionally considered part of in-class time. During out-of-class time, students typically explore class content through multimedia and other forms of technology. With attention to changing instructional delivery and increasing active student engagement, a flipped classroom model supports an OTL framework. Bearing in mind OTL and the dimension of time, it is important to note that this particular undergraduate course was constrained by the 150 minutes (75 minutes sessions twice a week) allotted each week. While an exciting notion, flipped classrooms remain under-researched and under-theorized in higher education (Abeysekera & Dawson, 2015). Indeed, our literature review only produced seven articles that met our criteria of flipped classroom models in higher education. Moreover, in our review of the literature we did not find any examples of flipped classrooms in teacher education settings. Thus, we hope that this study will contribute to the broader literature base around this burgeoning instructional model as well as its use within teacher education.

 In the limited research on flipped classrooms, several studies attribute benefits to this instructional model. Flipped classrooms improved learning outcomes in a variety of fields such as business (Albert & Beatty, 2014), nursing (Mattis, 2014), and computer science (Chen, Yuping, Kinshuk, & Chen, 2014). In one study, a flipped model supported higher learning outcomes with more complex content (Mattis, 2014). In addition to learning outcomes, flipped classrooms have demonstrated a positive trend in student satisfaction. For instance, in a survey of 142 students enrolled in a pharmacy course, 91% strongly agreed or agreed that the flipped format greatly enhanced their learning (McLaughlin et al., 2014). In another study, students in an environmental and occupational health course rated their satisfaction with the course a 4.7 on a five-point scale (Galway, Corbett, Takaro, Tairyan, & Frank, 2014), representing the highest course evaluation ratings in five consecutive years. This finding resonates with the work Chen and colleagues (2014), who found that the engaging classroom activities afforded by the flipped classroom had a direct influence on student satisfaction. In the limited literature around flipped classrooms in higher education, increased learning outcomes and student satisfaction seem to be key benefits of the model.

 The existing research also demonstrated some potential limitations with the flipped model. For instance, qualitative data showed students’ confusion with self-directed learning activities as they struggled to make connections between classroom activities and outside of class learning (Strayer, 2012). Additionally, some students confronted difficulty in altering classroom participation from passive to active (Chen et al., 2014). Grant (2013) noted logistical challenges in applying a flipped model to music education including students’ lack of technology access outside of class and time involved in designing both out-of-class and in-class activities for the instructor. Given these potential limitations, Abeysekera and Dawson (2015) caution researchers to consider the flipped classroom with scholarly skepticism and not as the “panacea” (p.12) promised by popular discourse.

**IRIS Center**

 Our study utilized online modules from the IRIS Center (iris.peabody.vanderbilt.edu) to design out of class instruction to serve as the knowledge foundation for in class activities. The IRIS Center is based out of Vanderbilt University and seeks to create course enhancement materials for pre-service teacher education. The modules draw on the research base of John Bransford and colleagues around adult learning theory (Bransford, 2009; Bransford, Brown, & Cocking, 2008). The modules present information through four overlapping lenses (e.g. learner, knowledge, assessment, community) to offer a variety of perspectives (Tyler & Sims, 2010). IRIS works with nationally recognized scholars, producing cutting edge research to develop its content. Additionally, each module goes through a rigorous review process and field-testing. We carefully curated the selection of modules and other resources to align with the five core practices of the course. The purpose of the IRIS modules was to provide the foundational knowledge that teachers needed before providing opportunities to apply their knowledge through practice during the course meeting time.

**Inclusive Education**

In implementing PBTP, scholars have advocated for building coherence for students around an overarching conceptual, theoretical, or philosophical frame for teaching (Hollins, 2011; McDonald et al., 2014, Waddell & Vartuili, 2015). Examples of such frames include constructivist learning or social justice. In framing the curriculum around a specific vision of teaching, pre-service teachers can cognitively organize core practices within a larger educational purpose (McDonald et al., 2014). In our course, we used inclusive education as the overarching frame for instruction. Grounded in the ideals of the Individuals with Disabilities Education Act of 2004 (IDEA), inclusion focused on providing students access to the general education curriculum in least restrictive environment. Our view of inclusion advanced the four outcomes of IDEA: equal opportunity, economic self-sufficiency, full participation, and independent living. This framework of inclusion was embedded throughout the course in the initial chapters of the textbook, multimedia presentations, guest speakers, and analyses of IEPs and instructional methods. Typically, inclusive education refers to the inclusion of students with disabilities into classrooms with nondisabled peers (Broderick, et al., 2012). However, in this course we extended the meaning of inclusive education to include other historically marginalized communities. Although the course foregrounded disability, we believe it is problematic to ignore the cultural and historical legacies of educational exclusion and segregation based on the cultural markers of difference, including but not limited to ability (Artiles & Kozleski, 2007). Our instruction interrogated the culture of schooling in relation to power and privilege, specifically around special education. Thus, the definition of inclusive education promoted in this course championed access, participation, and positive outcomes for all children, particularly individuals with historically marginalized social identities. Ideally, inclusive education would serve as a consistent framing used throughout the teacher preparation program. However, during the time of this study, our position did not afford us the opportunity to suggest sweeping programmatic changes across the entire School of Education. Therefore, the inclusive education framing was unfortunately limited to this single course.

**Research Design**

In light of the research on practice-based teacher preparation programs, OTL, and flipped classrooms, we developed a research design to evaluate if the flipped method had an impact on students’ knowledge acquisition, application of core practices, and attitudes towards inclusion and collaboration. As determined by the university, the course spanned a 16-week semester. Previously the course had been conducted through discussions of various disability categories each day with guest speakers and written examinations. In the re-design, the textbook remained consistent, but we divided the course into three units after an introductory pre-unit (see Table 1). The introductory pre-unit provided time to explain the study, review technology procedures, and build a class community. Each textbook chapter was paired with an IRIS Center module that corresponded to the content and application of the information. The flipped classroom and typical classroom lesson plans were developed simultaneously in order to ensure similar content knowledge for all the students in order to meet the goals of the course. The following paragraphs describe the sample, instructional designs, and data analysis in detail.

Table 1

*Research Design*

|  |  |  |  |
| --- | --- | --- | --- |
| Unit | Class 1 | Class 2 | Measures |
| Pre-Unit 1(3 weeks)Introductory Unit | (Pre-study) | (Pre-study) | No measures |
| Unit 1(4 weeks)Frameworks for Inclusion | Flipped | Typical | Demographic SurveyExam 1Social ValidityAttitude Measure (TATIS) |
| Unit 2(4 weeks)Categorical Disability Descriptions | Typical | Flipped | Exam 2Social ValidityAttitude Measure (TATIS) |
| Unit 3(4 weeks)Categorical Disability Descriptions | Flipped | Typical | Exam 3Social ValidityAttitude Measure (TATIS) |

**Sample**

 The study investigated two sections of an undergraduate introductory course on exceptional students at a Midwestern University. Within the first three weeks of class, instructors provided students with information about the study and an option to participate with signed consent. In total, 44 students out of 51 consented to participate in the study. The sample consisted of 36 females and eight males with 40 students that identified as White, three identified as Hispanic, and one identified as Other. Thirty juniors, eight seniors, two sophomores and two non-traditional students comprised the sample. While the participants came from a range of six majors in the School of Education (See Table 2), the entire sample included pre-service teachers in preparation for general education settings (e.g. elementary, secondary, music, health, etc.).

Table 2

*Identified Majors of Students in Sample*

|  |  |
| --- | --- |
| Major | Number of Students |
| Elementary Education | 22 |
| Music Education | 13 |
| Secondary Education | 3 |
| Visual Arts Education | 2 |
| Foreign Language Education | 2 |
| Physical and Health Education | 2 |

**Instructional Design**

 Researchers divided the course content into three four-week-long units throughout the study (See Table 1). Both course sections covered the same content throughout each unit, but differed on instructional method. The instructional methods included flipped (treatment) and typical (control). The typical instructional model followed a business as usual approach. Class 1 applied a flipped instructional model in Units 1 and 3 and a typical instructional model in Unit 2. Class 2 applied a flipped instructional model for Unit 2 and a typical instructional model for Units 1 and 3. We believed it was critical to provide both classes with the treatment to ensure the students met the goals of the course. As discussed previously, research has shown flipped classrooms and opportunities to learn increase learning outcomes. Ethically, it was important to give both classes the treatment to ensure the students were afforded equal opportunities to engage in collaborative, problem solving activities that we believed led to better teacher outcomes. Further, providing both classes the treatment allowed us to control for instructor qualities and class composition. If only one class had received the treatment it would have been challenging to identify if the instructional method impacted the change or if teacher quality or class composition impacted the results. Each class served as its own control by experiencing both the flipped and typical classroom instructional methods. Unit 1 focused on frameworks for inclusion including Response to Intervention (RTI), Positive Behavior Interventions and Supports (PBIS), culturally responsive instruction, and partnering with families. Unit 2 and Unit 3 concentrated on the thirteen categorical disabilities identified by IDEA.

The researchers defined typical instruction model as 50% or more teacher-led instructional time, which included lecture, question and response, and videos. Outside of class, instructors assigned a chapter from the course textbook along with a written activity. The flipped instructional model consisted of 5% or less teacher-led instructional time. During the remaining 95% of class time, the students engaged in a variety of student-led activities such as teach-backs, lesson planning exercises, fish bowl discussions, case study problem solving activities, debates, and IRIS generated activities. Outside of class, students read the same textbook chapter as in the typical instruction but completed a corresponding IRIS module and application assignment.

**Measures**

A total of five measures were administered in the study. At the time of consent, students completed a demographic survey, asking them to identify their race, gender, major, year of education, preferred grade level to teach post-graduation, and preferred teaching location to teach post-graduation. Students were also given the opportunity to identify and elaborate on their relationships with individuals with disabilities (i.e., whether they had a family member with a disability or had previously worked with an individual with a disability). We also administered the Teacher Attitudes Towards Inclusion Scale (TATIS) (Cullen, Gregory, & Noto, 2010) as a standardized attitude measure during consenting procedures and directly after each unit for a total of four points throughout the study. The measure consisted of fourteen statements rated on a 7-point Likert scale with 1 meaning “agree very strongly” and 7 meaning “disagree very strongly”. Questions 1-6 stated pro-inclusion sentences, questions 7-10 stated pro-continuum sentences (supporting specialized instruction for individuals with disabilities including separate educational settings), and questions 11-14 indicated pro-collaboration statements (supporting the collaboration between general education and special education teachers). Content validity of the TATIS was examined using the Equamax method with Kaiser Normalization. The components loadings showed a mean of 0.72 demonstrating that the TATIS aligned with the three factors identified in the literature (pro-inclusion, pro-continuum, pro-collaboration) that it was intended to measure. Moreover, the TATIS demonstrated reliability by using Chronbach’s alpha correlation procedure, which resulted in an overall correlation coefficient of 0.821. A third measure evaluated students’ knowledge of the five core practices. The researchers developed content-based knowledge assessments using twenty multiple-choice, true-false, and matching questions based on information in the textbook. These knowledge assessments were administered at the end of each unit, for a total of three points during the study. The fourth assessment was application based written exam that evaluated students’ ability to apply core practices within a lesson plan, as well as their problem-solving capacity based on realistic scenarios. At the end of each unit, students completed the application assessment at the same time as the knowledge assessment. In addition to the use of core practices, the application assessment gave pre-service teachers the opportunity to demonstrate their understanding of the inclusive frameworks presented in Unit 1.

The final measure, a social validity survey, evaluated students’ satisfaction with the method of instruction. Students completed this measure three times throughout the study, rating nine statements on a 5-point Likert scale with one representing strongly disagree and five representing strongly agree. The questions included statements about preparedness for the exam, matching of instruction to learning style, and general impressions about instructional method. The tenth question on the survey asked students to provide additional comments and feedback.

**Data Analysis**

 Our three research questions drove our analysis to investigate the effects of the flipped classroom on knowledge of core practices, application of content, and attitudes towards inclusion and collaboration. We used ordinary least squares (OLS) regression to analyze the data using STATA software. This method allowed us to control for demographic variables and determine if the flipped classroom model predicted knowledge, application, and attitudes. The following section discusses the analysis in more detail including variable selection and results.

**Results**

Our study addressed three research questions in the initial analysis of the data: (a) What is the effect of the flipped classroom instructional model on students’ knowledge acquisition of core practices?; (b) What is the effect of the flipped classroom instructional model on students’ ability to apply core practices for exceptional students in their lesson planning?; and (c) What is the effect of the flipped classroom instructional model on students’ attitudes towards inclusion and collaboration? To address each question, we ran several different analyses while controlling for demographic variables. The following describes each of the research questions and the data analysis process.

**Knowledge and Application of Core Practices**

 The first data model tested whether having more of the treatment (flipped classroom) affected scores on the core practices portion of the exams, and the second compared the two classes’ knowledge about core practices at each of the testing periods (after exam 1, exam 2, and exam 3). The second analysis addressed the students’ application of core practices while controlling for demographic variables and used scores from the application portion of the exam as the outcomes variable. Neither model showed any significance; therefore, we concluded the flipped classroom had no effect on the acquisition or application of core practices for the sample students. Thus, our analysis nullified our hypothesis that the flipped classroom would increase students’ knowledge acquisition and application of core practices. Next we turned our attention towards the attitudes of the students in the study.

**Student Attitudes**

 Students’ took the TATIS on four occasions across the study. The first data point occurred at the beginning of the study in order to capture attitudes of students before they received exposure to content or engaged in activities designed to promote inclusive attitudes. The next three data points transpired at the end of each exam: after seven weeks in the course (exam 1), after eleven weeks in the course (exam 2), and the final attitudes at the end of the sixteen-week course (exam 3). The ambiguous language of the pro-continuum statements showed most students chose a neutral position throughout the course and the questions were dropped from the analysis. We describe our analysis and results of the pro-inclusion and pro-collaboration statements in the next sections.

**Pro-inclusion attitudes.** The next models fitted predicted pro-inclusion attitudes at the end of the course while controlling for demographic variables including having a family member with a disability, working with an individual with a disability, and gender. We first analyzed both classes together adding in the variables in one block (See Table 3). The model was significant (p < .01) as well as the two variables: attitudes at seven weeks (p < .01) and attitudes at eleven weeks (p < .05).

Table 3

*Effects on Pro-Inclusion Attitudes at Course Completion*

|  |  |  |
| --- | --- | --- |
| Variable Name | Beta | SE |
| Family member with a disability |  .021 | .218 |
| Worked with an individual with a disability |  .049 | .197 |
| Gender | -.032 | .210 |
| Initial attitudes of pro-inclusion |  .209 | .147 |
| Attitudes of pro-inclusion at 7 weeks |  .408\*\* | .159 |
| Attitudes of pro-inclusion at 11 weeks |  .412\* | .153 |
| R2 |  .628\*\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

These results led us to conduct an analysis for each class using a step-wise regression model. The first model controlled for the demographic variables and the initial attitudes of pro-inclusion. In the second model, attitudes at seven weeks were added. Then, the third model added attitudes at eleven weeks as the final variable. Results for Class 1, the group that followed a flipped—typical—flipped instructional model, can be seen in Table 4. In model 1, one of the control variables showed significance (p < .05) in negatively predicting the final attitudes towards inclusion. However, in models 2 and 3, the attitudes at seven weeks demonstrated significance (p < .05) in predicting the final attitudes.

Table 4

*Effects on Pro-Inclusion Attitudes at Course Completion for Class 1*

|  |  |  |  |
| --- | --- | --- | --- |
| Variable Name | Model 1 | Model 2 | Model 3 |
|  | Beta | SE | Beta | SE | Beta | SE |
| Family member with a disability | -.302 | .337 | -.290 | .272 | -.265 | .454 |
| Worked with an individual with a disability | -.512\* | .326 | -.292 | .285 | -.307 | .315 |
| Initial attitudes of pro-inclusion | .211 | .247 | .082 | .205 | .009 | .232 |
| Attitudes of pro-inclusion at 7 weeks |  |  | .543\* | .173 | .536\* | .202 |
| Attitudes of pro-inclusion at 11 weeks |  |  |  |  | .127 | .299 |
| R2 | .384\* |  | .600\*\* |  | .571\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

We analyzed Class 2 using the same step-wise regression model (See Table 5). Initially, the first data point of the TATIS was significant (p < .01) but lost significance by the third model. Attitudes at seven weeks were significant (p < .01) in predicting the final attitudes across models 2 and 3.

Table 5

*Effects on Pro-Inclusion Attitudes at Course Completion for Class 2*

|  |  |  |  |
| --- | --- | --- | --- |
| Variable Name | Model 1 | Model 2 | Model 3 |
|  | Beta | SE | Beta | SE | Beta | SE |
| Family member with a disability | .042 | .308 | .152 | .257 | .220 | .209 |
| Worked with an individual with a disability | .419 | .328 | .466\* | .283 | .354 | .234 |
| Gender | -.067 | .307 | -.169 | .239 | -.050 | .201 |
| Initial attitudes of pro-inclusion | .716\*\* | .239 | .546\* | .200 | .485 | .162 |
| Attitudes of pro-inclusion at 7 weeks |  |  | .536\*\* | .251 | .258\*\* | .256 |
| Attitudes of pro-inclusion at 11 weeks |  |  |  |  | .473\* | .185 |
| R2 | .278 |  | .645\*\* |  | .772\*\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

Attitudes at the 7-week data point with Class 1 in the flipped model and Class 2 in the typical model predicated student attitudes at the end of the course. It appears the flipped classroom did not have an impact on attitudes.

 **Pro-collaboration attitudes.** Finally, we analyzed the pro-collaboration attitudes of the students. TATIS statements in questions 11 through 14 emphasized the importance of collaboratively working with general education teachers and special education teachers to support the needs of all learners in the classroom. The models fitted predicted final pro-collaboration attitudes while controlling for demographic variables (i.e. having a family member with a disability, working with an individual with a disability, and gender) across the data points. The first model combined both classes and we entered all variables in one block. The results displayed in Table 6 show the pro-collaboration attitudes at 7-weeks were significant in predicting final pro-collaboration attitudes (p < .01).

Table 6

*Effects on Pro-Collaboration Attitudes at Course Completion*

|  |  |  |
| --- | --- | --- |
| Variable Name | Beta | SE |
| Family member with a disability |  .123 | .243 |
| Worked with an individual with a disability |  .009 | .222 |
| Gender | .140 | .250 |
| Initial attitudes of pro-collaboration |  .011 | .162 |
| Attitudes of pro-collaboration at 7 weeks |  .632\*\* | .202 |
| Attitudes of pro-collaboration at 11 weeks |  .260 | .197 |
| R2 |  .674\*\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

We separated the two classes in order to analyze each of the data points and compare flipped instruction to typical instruction. A step-wise regression model was used to first control for demographic variables and initial attitudes, then added the second data point of attitudes at 7-weeks, and finally added attitudes at 11-weeks. Class 1 results are displayed in Table 7. In the first model, the initial attitudes towards pro-collaboration were significant (p < .05) in predicting final attitudes. In the second model the initial attitudes lost significance but attitudes at 7-weeks were significant in predicting final attitudes (p < .05). The third model shows all the data points losing significance and a demographic variable being significant (p < .05). However, more information would need to be collected to understand why this occurred.

Table 7

*Effects on Pro-Collaboration Attitudes at Course Completion for Class 1*

|  |  |  |  |
| --- | --- | --- | --- |
| Variable Name | Model 1 | Model 2 | Model 3 |
|  | Beta | SE | Beta | SE | Beta | SE |
| Family member with a disability |  .224 | .452 |  .219 | .385 | .369\* | .405 |
| Worked with an individual with a disability | -.264 | .391 | -.106 | .354 | -.004 | .308 |
| Initial attitudes of pro-collaboration |  .593\* | .192 | .234 | .211 | .057 | .189 |
| Attitudes of pro-collaboration at 7 weeks |  |  | .592\* | .271 | .632 | .366 |
| Attitudes of pro-collaboration at 11 weeks |  |  |  |  | .177 | .333 |
| R2 | .410\* |  | .574\*\* |  | .692\*\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

Class 2 results are shown in Table 8 with the same step-wise regression model. Model 1 shows the initial attitudes towards pro-collaboration were highly significant in predicting final attitudes (p < .01). However, across models 2 and 3, the initial attitudes lost magnitude and significance. The second data point, attitudes at 7-weeks, was significant in model 2 (p < .01) and significant in model 3 (p < .05) with only a slight change in magnitude.

Table 8

*Effects on Pro-Collaboration Attitudes at Course Completion for Class 2*

|  |  |  |  |
| --- | --- | --- | --- |
| Variable Name | Model 1 | Model 2 | Model 3 |
|  | Beta | SE | Beta | SE | Beta | SE |
| Family member with a disability | -.049 | .394 | -.025 | .345 | -.006 | .348 |
| Worked with an individual with a disability | .204 | .413 | -.011 | .368 | -.016 | .369 |
| Gender | .081 | .404 | .205 | .338 | .122 | .375 |
| Initial attitudes of pro-collaboration | .714\*\* | .251 | .118 | .300 | .009 | .335 |
| Attitudes of pro-collaboration at 7 weeks |  |  | .736\*\* | .237 | .602\* | .281 |
| Attitudes of pro-collaboration at 11 weeks |  |  |  |  | .286 | .358 |
| R2 | .375\* |  | .632\*\* |  | .631\*\* |  |

\* Significant at the .050 level

\*\* Significant at the .010 level

Similar to the results of the pro-inclusion attitudes, the most significant predictor of pro-collaboration attitudes appeared at the 7-week data point. At this data point, Class 1 received the flipped model of instruction while Class 2 received the typical model. Again, it appears the flipped classroom had no effect on pro-collaboration attitudes.

**Discussion**

 The original research questions in this study examined the effects of a flipped instructional model on students’ acquisition of core practices and attitudes towards inclusion and collaboration. Based on our analyses, the flipped instructional model in our study demonstrated no significant impact on student learning in both classes. However, we did find significance related to the impact of course content on students’ attitudes. In this section, we will discuss how these results have implications for PBTP.

 We initially hypothesized that the flipped instructional model of the course would serve as the key lever to increase student acquisition and application of core practices. Particularly, the flipped model seemed promising due to this model’s ability to increase opportunities to learn for pre-service teachers compared to the typical model. Ultimately, we did not find enough significance to reject the null hypothesis and determined that the flipped classroom in our study did not make a substantial difference in pre-service teacher learning. Future research should be conducted analyzing the flipped classroom model using a variety of different techniques. For instance, when using a course textbook, the instructor could develop his or her own instructional materials rather than relying on an outside source such as the IRIS Center. Conversely, instructors could use an outside source like the IRIS modules without using a textbook. In both cases, the instructor could maintain greater content alignment. The treatment design may have also affected the significance of the flipped classroom. Certainly this study represents only an initial investigation of the flipped classroom model in teacher education and further research is needed before drawing definitive conclusions.

Our third research question focused on student attitudes towards inclusion and collaboration. It is our belief that inclusive educators will need these dispositions in order to be effective. Based on the results, attitudes at the seven-week data point in both flipped and typical instructional models significantly predicted pro-inclusion and pro-collaboration attitudes at the end of the course. It is clear that the instructional models did not have a significant impact so we reflected on other factors that may be creating this effect. We noted that while the two classes engaged in different instructional models, they received the same content. When we further investigated the content, we recognized that the first unit focused on frameworks for inclusion (i.e. UDL, family collaboration, PBIS) and the second and third units focused on the disability categories identified in IDEA. Therefore, the frameworks for inclusion appear to have a greater effect on attitudes than the instructional model. Future research should not only look at instructional models but also the organization of content around a unifying framework for teaching and its impact on pre-service teacher attitudes. Moreover, future research should investigate the usefulness of a categorical approach as opposed to frameworks for inclusion in inclusive teacher education.

**Limitations**

In studying a single course for pre-service teachers, several limitations presented themselves. Firstly, the two sections consisted of a small sample size and homogeneous makeup. Additionally, the paper-based format of the assessments may not have captured the full capacity of the pre-service teachers to apply the core competencies taught in the course. An assessment with an observation component would allow students to demonstrate their knowledge in a more realistic setting. Throughout the course, the focus on inclusive education challenged pre-service teachers’ assumptions about education and ability. Therefore, the study would have benefited from a qualitative component to more deeply understand how this impacted their attitudes towards inclusion and collaboration.

**Implications for Practice-Based Teacher Preparation in Special Education**

Researchers promote a variety of models for PBTP to equip teachers with toolbox of practices to address a wide range of student needs (Ball & Forzani, 2009; Grossman, et al., 2009; Lampert et al., 2013; McDonald, Kazemi, & Kavanagh, 2013; Pella; 2015; Reid, 2011). Certainly, the flexibility to make these pedagogical moves will prove vital in a field as complex as teaching. However, Zeichner (2012) cautions that PBTP runs the risk of taking a narrow technical focus without a sophisticated grounding in the historical, cultural, and social contexts in which teachers work. In our study, students demonstrated an increased appreciation for inclusion and collaboration when the content was organized around frameworks for inclusion. This finding relates to a larger discourse in the literature around PBTP. McDonald and colleagues (2014) argue that teacher preparation redesign for the purposes of PBTP, must situate practice around a specific vision of teaching. This overarching vision should permeate the entire program. However, the authors lament the fact that, while programs might pay lip service to a unifying programmatic orientation or philosophy, it typically does not reflect a fundamental change to existing practices in teacher preparation. One promising example of integration of practice around a program-wide teaching philosophy is the holistic practice-based teacher preparation model proposed by Hollins (2011). In this example, Hollins orients the preparation of teachers around what she calls a philosophical stance in order to provide a vision and purpose for education. This helps pre-service teachers develop a deeper metacognitive understanding of their teaching practices. Moreover, she suggests that certain philosophical perspectives such as multicultural education, critical theory, or feminist pedagogy have the potential help pre-service teachers to situate their practices within a larger systemic framework that critically examines the contextual affordances and constraints of schooling. With these critical understandings, teachers can better use their practices in ways that promotes equity and social justice. Based on our findings, we advocate for increased research around PBTP within special education that integrates the technical practices of teaching within approaches that promote inclusive attitudes through critical reflections about ability and difference within education.

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