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Preservice Teachers' Planned Instruction: Predicted Versus Actual Use of Instructional Strategies

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Abstract

Educators have increasing responsibility for creating equitable and inclusive classroom models, but research suggests that they "may not have the necessary attitudes, dispositions, or perhaps more importantly, the professional skills to successfully instruct students in diverse, inclusive classrooms" (Van Laarhoven, Munk, Lynch, Boxma, & Rouse, 2007, p. 440). This study examines the effects of an interdisciplinary, co-taught curriculum in a Master in Teaching program on teacher candidates' predicted versus actual use of instructional strategies in inclusive K-12 classrooms. Teacher candidates (*N*=140) completed surveys at three data points: post-course, post-internship, and at the end of the first year of teaching. Participants reported using the following strategies most frequently with all K-12 students: "think alouds/explicit modeling," "direct instruction," and "cooperative learning." Constructivist approaches received the lowest mean scores. This study contributes to the emerging research about integrated teacher education programs and how they can better prepare future educators for creating inclusive classrooms.

Key Words: teacher education, instructional strategies, inclusive classrooms

1. Introduction

General educators are increasingly challenged to meet the needs of a wide range of learners found in today's classrooms, including students with disabilities (Arhaud, Aram, Breck, Doelling, & Bushrow, 2007). This research addresses the need for more practical discussions about teacher education curriculum and its effects on the beliefs and reported practices of general education teachers as they enter the profession. The study also responds to a key dilemma: how to provide K-12 teachers with a range of instructional strategies that increase their capacity to educate diverse learners in today's schools.

Ladson-Billings (2001) explains that preparing general education K-12 teachers for "diversity" has become a much more complex, multifaceted endeavor: "Not only [will teachers encounter] . . . multiracial or multiethnic [students] but [these students] are also likely to be diverse along linguistic, religious, ability, and economic lines" (p. 14). "Diversity" in classrooms today includes students with significant learning disabilities such as dyslexia and dyspraxia (related to reading and writing) and/or social and behavioral disabilities such as autism or emotional disturbance (Marder, 2009). Although educators have greater responsibility for creating equitable and inclusive classroom models, research suggests that that they "may not have the necessary attitudes, dispositions, or perhaps more importantly, the professional skills to successfully instruct students in diverse, inclusive classrooms" (Van Laarhoven et al., 2007, p. 440). This interplay of attitudes, dispositions, and skills may be influenced by the ways in which teacher candidates learn to define "effective instruction" in the first place. Aulls and Ibrahim's (2013) study examined preservice teachers 'perceptions of "effective inquiry instruction" (i.e., featuring more and different student and teacher roles, activities, and small group discussions), as distinct from the more generic term: "effective instruction."

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However, some experts in the field of teacher education (Fairbanks et al., 2010) argue that specified "professional knowledge" does not necessarily lead to effective, thoughtful, and adaptive teaching. They propose that "self-knowledge" and a "sense of agency" with the ability to purposely negotiate contexts maybe more important than one's knowledge base (p. 161).

Preservice teachers' conceptions of good instruction may be directly influenced by their beliefs and attitudes about their students. In "Preparing Teachers for Inclusive Classrooms," Jordan, Schwartz, and McGhie-Richmond (2009) claim that effective inclusionary practices partly depend upon teachers' beliefs about disability and their ownership of responsibility for students with special needs. Teacher educators play a central role in influencing candidates' attitudes and ultimate instructional choices that consider the individual needs of a range of students in their classrooms. Current practices in teacher education programs should be examined and instruction adjusted to make the general-education/special-education partnership more viable and better integrated in teacher practice (Blanton & Pugach, 2007).

1.1 A Common Set of Instructional Practices

How do teachers promote effective instruction for a wide range of learners in a practical way? Teacher educators can present a set of common instructional practices to all preservice teachers. Without an identifiable set of core practices to anchor instruction for both teacher educators and beginning teachers, improvement in instruction within and across institutions will continue to be isolated, individual, and haphazard. Part of the solution is to bring current research to bear on the development of practices that all aspiring educators in the various subject matter areas can become proficient in—a recognizable beginner's repertoire. (Windschitl, Thompson, & Braaten, 2009, p. 2)

Despite this argument from Windschitl et al. (2009), an ERIC search of journal articles in this study (2000 to present) with search terms including "teacher education," "educational strategies," and "inclusive schools" yielded few current studies that examine basic instructional strategies applicable to general education teachers of all disciplines (e.g., McGhie-Richmond, Underwood, & Jordan, 2007; Wilke & Losh, 2008).

Studies addressing preservice teachers' instructional intentions primarily focus on their pedagogical and self-efficacy beliefs without examining their planned instructional actions (Chan & Elliot, 2004; Ng, Nicholas, & Williams, 2010; Ozgun-Koca & Sen, 2006; Palmer, 2006;). However, Wilke and Losh (2008) proposed an alternative to measuring beliefs and inferring instructional intentions. Their mixed-methods design required preservice teachers to identify the instructional strategies they might use in a given week of hypothetical teaching, then to complete a survey in which they rated how often they intended to use 12 specific strategies in their respective content areas. Results indicated that preservice teachers selected a wider range of strategies than earlier studies had reported (Chan & Elliott, 2004; Minor, Onwuegbuzxie, Witcher, & James, 2002), and that participants were not necessarily focused on a more "transmissive" (teacher-delivered) rather than a "constructivist" (student-centered) instructional approach, as the researchers had hypothesized. Yet Wilke and Losh's (2008) study merely captured teacher candidate's *plans* early in the teacher education course—before they had teaching experience.

McGhie-Richmond et al., (2007) studied elementary teachers' actual *use* of effective instructional strategies within inclusive classrooms—with special attention to the instruction teachers provided to students with disabilities. Using 27 items from the Classroom Observation Scale (Stanovich, 1994; Stanovich & Jordan, 1998), they observed 63 elementary teachers over half-day periods of time, teaching one to four lessons. Citing evidence of the "fractious debate" about transmitting versus constructing knowledge, they examined evidence for the claim (Torff, 2003) that novice teachers initially use more "transmissive" approaches and then develop expertise for tapping higher-order thinking over time. McGhie-Richmond et al. (2007) found that years of teaching was not a predictor of instructional approach and that effective teachers used a "broader set of skills" rather than constructivist techniques (p. 39). Although students with special needs received instruction similar to that of general education students in their study, students identified as "at-risk" received fewer instructional interventions than their general education counterparts did. However, the "range of skills used by the high scoring teachers in their study was broad and often innovative, and defied a simple classification of constructing vs. transmitting knowledge" (p. 41). Their research findings point to the danger of over-generalizing specific prescriptions for practice with particular students or student populations.

The current study complements McGhie-Richmond et al.'s (2007) research by examining effective instruction within inclusive general education classrooms. Both secondary and elementary teacher candidates were included in this participant sample.

This study responds directly to Wilke and Losh's (2008) call for studies that "employ pre- and post-measures to explore the impact of education courses on preservice teachers' selection and use of instructional strategies" (p. 72). It views the use of instructional strategy through the lens of inclusivity because the teacher education curriculum that was examined features a fluid approach to teaching all students—whether "typically developing" or those with disabilities. Therefore, this study builds upon previous research by investigating more specifically the effects of an interdisciplinary, co-taught curriculum on teacher candidates' predicted versus actual use of instructional strategies in their K-12 classrooms in order to promote equity in the educational experiences of all types of learners. The following research questions were addressed:

1. What instructional strategies and theories do teacher candidates *predict* that they will use most frequently in inclusive classrooms (with "typically developing" students vs. students with special needs).
2. What instructional strategies and theories do participants report that they *actually use* (with "typically developing" students vs. students with special needs) after they begin teaching.

2. Methods

Researchers in teacher education point to the limitations of more traditional empirical models of "scientifically-based research" endorsed by the No Child Left Behind legislation (NCLB), arguing "experimental designs modeled after medical research … cannot answer all the important questions the field faces" (Liston, Whitcomb, & Borko, 2007, p. 100). This critique suggests the value of using multiple genres of research (Borko, Liston, & Whitcomb, 2007; Grossman & McDonald, 2008), particularly those that fall under the category of "practitioner research," including action research and self study, which examine teacher practice "from the inside" and share the features of intentionality and systematicity (Cochran-Smith & Donnell, 2006). Self-study, however useful to individual programs, must move beyond what the name suggests and become more widely accessible within the field (Loughran, 2007) so that teacher education practices and outcomes can be refined, clarified, and enhanced. Drawing primarily on self-report data, this study focused on the teacher candidates' use of specific instructional theories and strategies in response to specified program and course features.

2.1 Curricular Context: Program Design

The one-year, four-block graduate Master in Teaching program provides teacher candidates with an intensive, full-time educational experience that builds upon their in-depth undergraduate preparation in an academic major by offering advanced study in professional education at the graduate level. The Master in Teaching (MIT) program is team-designed and team-delivered with the following organizing theme: "The teacher is an ethical, knowledgeable, reflective decision maker who teaches all learners to function effectively in a global and pluralistic society." Unlike some larger teacher education programs, the MIT faculty (six full-time, two part-time, and three adjunct members) regularly collaborate in the design of all courses and assignments so that the program curriculum is highly integrated around this theme. With a primary focus on social justice, the program features "culturally responsive teaching" and "special needs" instructional strands, which are woven throughout the program rather than offered as single courses that occur once a year.

The content of the Psychology of Learning (PL) course, a focus of this study, is allied with the program's focus on social justice by instructors modeling the collaborative practices necessary in equitable, inclusive classrooms and presenting teacher candidates with a basic framework for effectively differentiating instruction for diverse learners. The PL course focuses on foundational skills and practices necessary for effective lesson planning and classroom management in the internship setting and beyond. Co-taught by professors in both educational psychology and special education, this course includes over 60% of the instructional time in the first quarter of the MIT program and focuses on theories and practices of effective learning and teaching for *all* students. Candidates seeking both general education or special education endorsements participate together in all learning experiences throughout the course. Curricular features of the course include:

1. Instructional approaches: Direct instruction, cooperative learning, constructivist/inquiry-based, and metacognitive approaches (e.g., use of think alouds);
2. Topics of emphasis: Multiple intelligences, learning styles, culturally responsive classroom management, motivating reluctant learners, and brain-based instruction;

3. Performance-based assessments: Direct instruction lesson plan, cooperative learning lesson plan, classroom management plan.

The conceptual model used to guide the planning and instruction in the PL course is based on principles of differentiated instruction (Tomlinson & McTighe, 2006), emphasizing that one approach or style of teaching will not meet the needs of most students. In this model the teacher candidates learn that *all* students have both learning strengths and challenges that teachers must be prepared to address in their lesson planning and instructional presentation (Giangreco, 2007; Tomlinson & McTighe, 2006; Van Garderen & Whittaker, 2006). Teacher candidates learn—from the beginning of their coursework—how to effectively plan and implement accessible and equitable instruction that meets the needs of as many learners as possible, and how to make individualized adjustments to assessments, instruction, and assignments that differentiate for those learners who still need extra scaffolding and support.

The broad goals for the PL course are:

1. To expand the teachers' understanding of successful learning so that *more* students can experience success in general education classrooms rather than failure;
2. To increase teacher candidates' repertoire of instructional strategies and tools to meet the needs of as many students as possible in order to promote successful learning experiences;
3. To heighten awareness of how society and schools have developed systems that perpetuate failure and overemphasize disability (Hehir, 2007).

2.2 Participants

Upon their completion of the PL course, all MIT candidates from the 2008-2009 and the 2009-2010 academic years (four cohorts of approximately 50 students each) were invited to participate in the study. Of these, 140 volunteered to participate. Half of the teacher candidate population pursued endorsements in secondary education and the remaining half sought endorsements in elementary education. The majority of the candidates were female (78%) with males representing 22% of the total. The demographic breakdown included: African American (2%), Asian American (9%), Caucasian (65%), Hispanic (2%), Mexican American (2%), Multicultural (5%), Pacific Islander (2%), Unknown (13%).

2.3 Measures

To examine the impact of the PL curriculum on teacher candidates' plans for effective instruction, two nearly identical computer-based surveys were created. Surveys were released to participants at two data points (post-course and post-internship). After the PL course ended, all candidates received an e-mail invitation to complete an initial survey through Survey Monkey software. Each participant completed a release form and then accessed the survey with an assigned numerical code. Participants followed an identical process after completing their internships in the third quarter of the program. The initial post-course survey asked teacher candidates to predict the instructional strategies they would regularly use with typically developing students and students with special needs, whereas, the post-internship survey asked candidates to report the strategies they *actually* used most frequently and effectively to meet the needs of all students.

Using a Likert scale with ratings of 4 (frequently), 3 (sometimes), 2 (infrequently), and 1 (hardly ever), candidates predicted (post-course) or reported (post-internship) use of both (a) "instructional strategies" and (b) "theories [that] influenced [their] planning and instruction" with "typically developing students." Next, they rated the same "strategies [and] theories for their effectiveness in supporting students with special needs." (See the Results section for specific instructional strategies and theories surveyed.) Finally, a participant subgroup (n = 70**)** responded to the survey questions at a third data point (during the spring of their first year of full-time teaching.)

In addition to the descriptive statistics compiled, the results include data analyses of the larger participant pool, including: (a) paired sample t-tests to determine the post-internship mean differences in the applicability of strategies and theories *to two K-12 student populations* (typically developing versus students with special needs) and (b) paired sample t-tests to detect mean differences *over time*: post-course (predicted) versus post-internship (actual). The survey administered at the third data point (during a participant subset's first year of teaching) included the following survey questions only:

"How frequently did you use the following instructional strategies during your first year of teaching?" and "Which of the following theories influenced your planning and instruction during your first year of teaching?" These two questions addressed strategies and planning for *all* K-12 students (rather than students with special needs, specifically); therefore, data analysis with this sub-group focused purely on mean differences by time using a one-way ANOVA.

3. Results

The participants' combined mean scores over time (post-course and post-internship) reflect the instructional strategies rated highest for frequency of use. Table 1 displays mean scores relative to key instructional methods used with "Typically Developing Students" versus "Students with Special Needs." The most popular instructional approaches applied across both K-12 student categories were:

1. The "use of think alouds and explicit modeling," which emphasize detailed, extemporaneous verbal modeling of a particular skill by teachers and/or their students (Block & Israel, 2004; Collins, Brown, & Newman, 1989);
2. "direct/explicit instruction," which features the seven elements of lesson design (set, communication of learning target, input, modeling, check for understanding, guided practice, independent practice, and closure); (Hunter, 1991; Joyce & Weil, 2009);
3. "Cooperative learning," a highly structured approach to group learning, focusing on the key elements of positive interdependence, face-to-face promotive interaction, individual accountability, and group processing (Frey, Fisher, & Everlove, 2009; Johnson, Johnson, & Johnson Holubec, 1994). "Constructivist" approaches received the lowest mean rating; teacher candidates in the PL course read about constructivism and participated in an inquiry-based lesson, using the "storypath" curriculum **(**McGuire, 1997).

Teacher candidates' mean ratings for "predicted" (post-class) versus "actual" self-reported (post-internship) strategy use are similar across both student populations (i.e., general education versus special education). See Table 1. However, the candidates' reported post-internship mean ratings were generally lower when they rated applicability of instructional approaches for "students with special needs." A paired sample *t*-test comparison of post-internship means **(***n* = 112**)** by student population revealed a statistically significant difference in the applicability of "direct instruction," $t(111) = 2.52$, $p = .013$, and "use of think alouds," $t(109) = 2.70$, $p = .008$, for students with special needs (vs. typically developing students). However, "cooperative learning," $t(111) = -.31$ $p = .76$, and "constructivist approaches" mean comparisons by student group, $t(111) = .000$, $p = .1.00$, reflect no significant differences. Although not statistically significant, the teacher candidates' post-internship mean ratings indicate that they reported use of cooperative learning methods with the special needs population as much or slightly *more* than with the general population of students.

Table 1: Teacher Candidates' Instructional Strategies (n=112): Predicted Use versus Actual Use by Student Population

Instructional method	Students				
	typically developing	special needs			
	Mean (SD)	Mean (SD)	t	df	p
Use of think alouds					
Predicted (Post-class)	3.68 (.51)	3.72 (.55)	1.23	119	.220
Actual (Post-internship)*	3.67 (.64)	3.47 (.87)	2.70	109	.008*
Combined total	3.67 (.62)	3.61 (.72)			
Direct instruction					
Predicted (Post-class)	3.70 (.49)	3.66 (.53)	.249	120	.804
Actual (Post-internship)*	3.60 (.62)	3.41 (.70)	2.52	111	.013*
Combined total	3.65 (.55)	3.55 (.62)			
Cooperative learning					
Predicted (Post-class)	3.44 (.59)	3.46 (.63)	1.23	120	.221
Actual (Post-internship)	3.36 (.73)	3.38 (.77)	-.31	111	.759
Combined total	3.40 (.66)	3.42 (.69)			
Constructivist approaches					
Predicted (Post-class)*	3.31 (.67)	3.16 (.66)	3.70	119	.000*
Actual (Post-internship)	2.92 (.93)	2.91 (.95)	1.0	111	
Combined total	3.13 (.82)	3.05 (.81)			

*Post-internship mean differences by student population are statistically significant ($p<.05$)

Teacher candidates also rated theoretical course content for applicability in their respective K-12 internship classrooms (see Table 2). The following curricular content received the highest mean scores for frequency of use upon completion of the twelve-week internship: (a) "elements of lesson design" (Hunter, 1991; Joyce & Weil, 2009) drawn from our direct instruction teaching model above, (b) Gardner's (1983) MI theory, (c) "learning style theories" (Dunn, Dunn, & Price, 1989; Myers & McCaulley, 1985; Witkin, Moore, Goodenough, & Cox, 1977), and (d) "Bloom's taxonomy" (Anderson & Krathwal, 2001; Bloom et al., 1956). The curricular topics that consistently received lower mean scores (below 3.00) with both student populations included "understanding brain development and learning," "memory/information processing theories," and "motivational theories."

Table 2: Theoretical Content Candidates Reportedly Applied in Internship Setting

Theoretical content	Students	
	typically developing	special needs
	Mean (*SD*)	Mean (*SD*)
Lesson design elements	3.70 (.55)	3.44 (.72)
Bloom's taxonomy	3.05 (.88)	2.81 (.96)
Multiple intelligences theory	3.46 (.71)	3.36 (.85)
Learning style theories	3.54 (.60)	3.50 (.71)
Brain development & learning	2.80 (.85)	2.83 (.98)
Memory/info processing theories	2.88 (.77)	2.91 (.84)
Motivational theories	2.99 (.78)	3.14 (.87)

Mean differences between participants (n= 121) who completed both surveys at Time 1 (pre-internship) and Time 2 (post-internship) were compared using a paired sample t-test. Table 3 displays the t-test results for reported use of instructional methods. Because all mean scores dropped somewhat from Time 1 to Time 2, analysis was focused on those strategies, and theories that maintained mean scores with *no* statistically significant drop after teaching. There was no significant difference in the mean scores for the following instructional strategies: "direct instruction," "cooperative learning," and the "use of think alouds." Only one instructional method ("constructivist approaches") significantly dropped from Time 1 to Time 2, $t(119) = 3.70$, $p = .000$.

Table 3: Instructional Methods for All Students: Pair Sample T-test Results by Time

	Time 1	Time 2			
Instructional method	Mean (SD)	Mean (SD)	t value	df	p
Use of think alouds	3.73 (.51)	3.65 (.66)	.249	119	.220
Direct/explicit instruction	3.67 (.50)	3.66 (.58)	1.23	120	.804
Cooperative learning	3.43 (.60)	3.31 (.77)	1.23	120	.221
Constructivist approaches	3.26 (.67)	2.90 (.91)	3.70	119	.000

3.1 First-Year Teacher Data: Analysis of Variance

Study participants (post-class and post-internship) represent four cohorts of teacher candidates from two academic years (as stated above). Data was also collected a third time from a group of 2010 graduates only (n = 70) during the spring of their first year of teaching. A one-way ANOVA revealed mean differences across three points in time: at the end of the course, the internship, and participants' first-year of teaching. Two of the four instructional strategies featured in the survey did not have a statistically significant (p<.05) drop in reported classroom use over time: "direct instruction," $F(2, 177) = 2.47$, $p = .09$, and "think aloud instruction," $F(2,176) = .89$, $p = .42$. Participants' mean scores over time concerning theoretical content utilized used reflected no significant drop in the application of two conceptual categories: the application of (a) "learning style theories," $F(2,177) = .54$, $p = .58$, and (b) understanding of "brain development and learning" (e.g., mirror neurons, neuroplasticity, basic neuroanatomy), $F(2,176) = 2.23$, $p = .11$. Table 4 presents means and standard deviations for this final group of students across three data points.

Table 4: Instructional Approaches: Frequency Means and Standard Deviations for 2010 Cohort

Instructional method	Time 1 (n = 74)	Time 2 (n = 39)	Time 3 (n = 67)	Total
	Mean *(SD)*	Mean *(SD)*	Mean *(SD)*	Mean *(SD)*
Use of think alouds	3.62 (.70)	3.44 (.75)	3.51 (.73)	3.54 (.72)
Direct/explicit instruction	3.76 (.43)	3.64 (.10)	3.55 (.61)	3.65 (.55)
Cooperative learning	3.46 (.55)	3.28 (.65)	2.94 (1.01)	3.22 (.80)
Constructivist approaches	3.35 (.67)	2.87 (.97)	2.22 (1.09)	2.83 (1.04)
Theoretical content				
Learning style theories	3.53 (.71)	3.59 (.59)	3.45 (.74)	3.51 (.70)
Brain development & learning	3.03 (.76)	2.67 (.98)	2.82 (.99)	2.87 (.91)

Note. Time 1 = Pre-internship; Time 2 = Post-internship; Time 3 = First-year teaching

3.2 First-year teachers' supervisor evaluations

To supplement the self-report data in this study, supervisor evaluations were completed in the spring of the 2010 graduates first year of teaching to provide an indicator of first-year teachers' general facility with instruction. Immediate supervisors (e.g., administrators, department leaders, etc.) responded to a holistic question that rated first-year teachers' pedagogical knowledge and skills: "On, a scale of 1 to 10, with 10 being high, to what degree does this individual positively impact student learning?" The mean rating for our 2010 graduates (n=70) was 8.0 out of 10.

4. Discussion

The instructional approaches that teacher candidates rated most useful for typically developing students were direct instruction and the use of think alouds—with cooperative learning also receiving a fairly high mean score (i.e., above a 3 rating: "sometimes"). Constructivist approaches received the lowest mean scores. When rating the applicability of instructional approaches for typically developing students versus students with special needs during their internships, participants reported a statistically significant drop in their use of direct instruction, think alouds, and constructivist approaches when teaching students with special needs. Interestingly, cooperative learning was rated strongly when used with *both* groups of students. The surveys collected at the third data point (during a participant subset's first-year of teaching) indicated that direct instruction and the use of think alouds maintained high means, with no statistically significant drop over time.

When applying theoretical content from the PL course, participants also rated the following most useful during their internship (a) elements of lesson design (Hunter, 1991; Joyce & Weil, 2009*)* drawn from the direct instruction teaching model above, (b) Gardner's (1983) MI theory, (c) learning style theories **(**e.g., Dunn et al., 1989; Myers & McCaulley, 1985; Witkin et al., 1977), and 4) Bloom's taxonomy (Anderson & Krathwal, 2001; Bloom et al., 1956). Program graduates still rated the same content areas highly in the survey administered at the third data point (first year of teaching). However, first-year teachers' mean scores significantly dropped for all of the instructional theories above—with the exception of learning style theories.

4.1 Implications for Practice

The teacher candidates' responses as reflected in this data spark a number of questions that currently inform program revision. First, with the controversy around learning style theory, why did this sample of teachers find this theoretical approach most relevant over time? Second, although cooperative learning (Johnson et al., 1994) has been around for a while, is there now greater potential for its applicability within diverse, inclusive classrooms? Third, what did the participants find particularly useful in the two most frequently applied methods: direct instruction (traditionally considered a behaviorist approach) and use of think alouds (a metacognitive approach)? Finally, and perhaps most importantly, why do participants claim to apply student-centered, inquiry-based, constructivist approaches most infrequently—and what might they lose when they eschew these approaches?

4.1.1. The popularity of learning style theories

Critics of learning styles theories (Pashler, McDaniel, Rohrer, & Bjork, 2008; Willingham, 2005) commonly claim that there is not enough sound, empirical evidence to substantiate many learning theories and the simplistic labeling of learner types. Wilke and Losh (2012) analyzed preservice teachers' longitudinal data (e.g., lesson plans, interviews, written rationales) to trace conceptual changes in their mental models during their coursework, finding that preservice teachers focused on "learner types rather than learning processes" (p. 221). In the PL course, the instructors acknowledged both the criticisms of learning theories and the overgeneralization of learners as types while maintaining that teachers can benefit from multiple lenses and tools for "mixing it up" or differentiating instruction and assessment strategies. Landrum and McDuffie (2010) recognize that general and special educators find that the notion of learning styles holds intuitive appeal. They suggest that "a growing emphasis on differentiated instruction may have further increased teachers' tendency to look at learning styles as an instructionally relevant variable when individualizing instruction in increasingly heterogeneous classrooms" (p. 6). Tomlinson's (2003) differentiation model does call for adjustment of instructional content, process, and products based on students' readiness, interests, and learning profiles. However, evidence suggests that directly matching instructional modalities with students' preferred learning styles isn't necessarily effective. In fact, such attempts oversimplify a more complex process of differentiation that must account for student thinking and readiness to learn (Landrum & McDuffie, 2010; Rock, Gregg, Ellis, & Gable, 2008).

4.1.2. Cooperative learning for all students

Teachers in this study also rated cooperative learning highly, particularly as an instructional approach useful to students with special needs. Cooperative learning isn't new to K-12 instructors' repertoires (Frey et al., 2009; Johnson et al., 1994;), yet Schul (2011) points to a resurgence of interest in this method because it potentially provides a 21st century social skill set for today's classrooms. He identifies several key outcomes of cooperative learning that directly address "democratic citizenship" such as "concern for others," "peaceful confrontation," and "diverse relationships." However, many teachers misapply and confuse highly structured cooperative learning with looser forms of group work. True cooperative learning involves group work designed to nurture strong social interdependence and individual accountability among students (Johnson, Johnson, & Smith, 2007).

Jenkins, Antil, Wayne, and Vadasy (2003) interviewed 21 teachers regarding their use of cooperative learning and found that a majority of them practiced "soft" forms of cooperative learning where individual accountability was not emphasized. They found that the most frequently cited benefits to students were … "self esteem the security that comes from being part of a group, and higher success rates and/or better products" (p. 283). Other researchers in special education (Grenier, Dyson & Yeaton, 2005; Sapon-Shevin, 1999) point to the direct benefits of cooperative learning on students with learning disabilities, supporting the self-report data from teacher candidates in this study.

Cooperative learning is considered a more student-centered approach, albeit with substantial scaffolding and teacher support. Yet teacher candidates in this study clearly indicated that the two most frequently used instructional strategies were direct instruction and the use of think alouds.

4.1.3. Constructivism vs. behaviorism: A false dichotomy?

Results also indicated that teachers used constructivist approaches less frequently than direct instruction, think alouds, and cooperative learning. This finding corroborates previous research (Torff, 2003), yet approaching these two styles of teaching as mutually exclusive is an extreme view (McGhie-Richmond et al., 2007). Traditionally, direct instruction is viewed within a behaviorist framework. However, every academic year professors dissuade the teacher candidates in the PL course of the belief that this form of instruction is primarily lecture-based and "transmissive." Effective direct instruction features some "input" from the teacher but relies upon ongoing monitoring and feedback as students actively engage in forms of practice that reinforce learning of a skill or concept. While the use of "cognitive apprenticeship" (Collins et al., 1989) in the form of classroom think alouds can also be teacher-led and transmissive in nature, teacher candidates practice using think alouds in a number of student-centered, inquiry-based contexts such as "thought detectives" in think-pair-share and small group contexts.

4.1.4. Broadening applications of effective inquiry-based instruction

Participants reported using fewer constructivist approaches during early teaching experiences. This finding may complement the research cited in the literature review (Torff, 2003), indicating that teachers with more experience employ more student-centered approaches. Further, a recent mixed methods study of 101 preservice teachers conducted by Temiz and Topcu (2012) suggests that teachers with higher self efficacy beliefs tend to use constructivist approaches while those reporting lower teacher self efficacy use more traditional, lecture-based approaches. It is possible that the participants in this study might report increased use of these strategies if they were surveyed after their second, third or fourth years in classrooms. Student-centered approaches can yield positive benefits for all students. Steele (2005) points to the value and applicability of constructivist principles in teaching students with special needs, for example, relating lessons to real life situations, starting with information and examples connected to students' previous experiences, focusing on only a few ideas per lesson, and promoting students' active involvement in lesson activities with clear explanations and guidance.

As a result of the findings of this study a greater emphasis will be made on identifying and more explicitly modeling a range of specific, student-centered teaching methods within the MIT curriculum, overall (e.g., reciprocal teaching, cognitive apprenticeship, discovery learning, problem-based learning) while maintaining the flexible application of each approach—with appropriate scaffolding to benefit students with a wide range of learning needs embedded in each. Results also indicate that the teacher candidates could benefit from discussions and activities that explore the broader value of key constructivist principles when applied to general instructional planning and design. The PL course now features more readings regarding constructivist principles (linked to cognitive science) earlier in the program so that candidates can be more deliberate and strategic in using learner-centered principles with both typically developing and students with special needs. The course currently begins with a rich discussion of these principles that draws from Bransford (2000) and Yilmaz (2011).

4.2 Strengths and Limitations

Strength of this research and its findings is the range of participants, spanning four cohorts and two academic years (2008-2009 and 2009-2010). Means and *t*-test results run within individual 2009 and 2010 cohorts corroborate and support the combined descriptive statistics presented across groups (while group x time mean differences were not statistically significant). Although the findings include primarily self-report data, a sub-set of the participants' (n = 70) survey results encompass three data points that span over 2 years of academic and teaching experience per participant (post-course in the first quarter of the program, post-internship, and the end of their first year of teaching). A limitation of the study is that self-report report data lends itself to the social desirability bias (i.e., respondents may have answered questions more positively to affirm their former professors' instruction).

However, this possible bias likely lessened over time as course instructors/researchers no longer taught or interacted with students around the second and third survey distributions. Therefore, one might assume that first-year teacher (i.e., Time 3) results best represent the most bias-free responses of the three data points. Regardless, candidates' self-report data may simply reflect what they value and think they should be doing to plan and implement quality instruction rather than accurately reflecting what they actually are doing.

Participants may not have always responded with accuracy due to cognitive biases, retrospective reporting, lack of self-knowledge, and/or poor memory. In soliciting participants' reported use of instructional strategies, investigators were capturing both their recall and interpretation of theoretical constructs and instructional approaches that instructors modeled and candidates applied throughout the teacher education program. The survey items themselves also inevitably limited participants' responses due to the specific language used and the strategy names the instructors labeled and identified. It cannot be guaranteed that the former teacher candidates understood and fully utilized these strategies accurately or effectively in their classrooms. To address the limitations above, investigators used the feedback from the immediate supervisors of the first-year teachers to provide an indicator of the participants' instructional effectiveness in meeting the needs of all students in their K-12 classrooms.

4.3. Conclusion

This study features reports from teacher candidates and first-year teachers about the most relevant strategies and theories influencing their day-to-day instructional practices. Rather than being simple "convenience" research (Knight et al., 2012), in response to a course and program, this study's findings augment the nominal research about candidates' planned instructional actions (Wilke & Loshe, 2008) and the applicability of varying instructional strategies within inclusive classrooms (McGhie-Richmond et al., 2007). This research further explores the definition of "effective instruction" and teacher candidates' conceptions of this vision in practice with diverse groups of learners. This work may also inform teacher educators' curricular planning as they shape and influence candidates' instructional dispositions and skills and help them to gain a stronger sense of efficacy in inclusive classrooms. Finally, these results certainly indicate some of the learning theories and pedagogical activities that candidates value and identify as most useful for anchoring instruction in K-12 classrooms.

In light of the research shortage on beginning teachers' instructional plans and choices, the chasm between theory and practice continues to loom large. "Education schools need to embrace the reality that they are professional schools and refocus their work on the world of practice and practitioners. It is the only way they can become both excellent and useful" (Levine, 2006, p. 104). This valuable work can ultimately influence changes in course content as well as larger programmatic revisions—to better prepare teacher candidates to be effective and successful in meeting the needs of students in diverse classrooms.

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