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The effects of implementing recitation activities on success rates in a college calculus course[1]

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Abstract: This study investigates the effects of using different types of recitation sessions with a large-enrollment section of a college calculus course on student achievement, success rates, and first-year retention. Over a period of six years, three different types of recitation sessions were implemented into the large enrollment section of a calculus course. During the fall semesters, the results on the departmental final examination, the DFW rates, and the one-year retention rates of students as STEM majors were examined by the type of recitation session used. The three types of recitation sessions studied were: (1) optional mentoring sessions at the Math Assistance Center conducted by undergraduate students (peer mentors), (2) required mentoring sessions conducted by graduate students, and (3) required VGNA (Verbal, Graphical or Geometric, Numeric, and Algebraic) Concept activities, which were also coupled with mentoring sessions conducted by graduate students. The success of the students in the large enrollment section of the course, which included one of the three different types of recitation sessions, was compared to the success of students in the small enrollment sections of the course (enrollments less than 50 students). The results of this study demonstrate methods of raising student success rates in large enrollment (lecture-format) courses.

Keywords: calculus, active learning, concept understanding, college teaching, pedagogy.

Introduction

In order to retain and graduate more STEM majors on campus, this study investigated the effects of using different types of recitation sessions with a large-enrollment lecture-format first semester college calculus course on student achievement (as measured by the departmental final examination), student success rates in the course (as measured by the DFW rates), and first-year retention in a STEM discipline (as measured by the number of students who, after taking the first semester calculus course in the fall, were retained in a STEM discipline a year later).

Freshman-level courses, such as calculus, often act like a filter instead of a pump for science, technology, engineering, and mathematics (STEM) majors (Steen, 1988). In the United States, more than 40% of students fail their first-year mathematics course (Wieschenberg, 1994).

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Students participating in exit interviews after dropping out of engineering at Purdue University cite difficulty with their first mathematics course as a primary reason for leaving (Budny, LeBold, & Bjedov, 1998). At Indiana University Purdue University Indianapolis (IUPUI), this effect of calculus being a filter is apparent. In recent years, IUPUI has launched an effort called Gateway to Graduation to improve student learning and retention in courses with high first-year student enrollment. With campus recognition of retention issues in Gateway courses, the investigators of this study obtained NSF funding (#0969500), to adapt and adopt best practices, in order to increase student retention in, and persistence toward graduation for, STEM majors.

IUPUI is an urban research and life sciences university, formed in 1969, that serves a large (31,000 students) and diverse student population. Approximately 62% of the entering students each year are first generation college students, 16% of the student body belongs to a minority group, and well over 90% are commuters. Moreover, 32% of students who begin their collegiate experience at IUPUI graduate from the institution within six years, and slightly over 70% of the freshman class are retained to the sophomore year. Over the last few years, the institution has focused on improving graduation and retention rates, giving primary attention to freshman retention and success initiatives. These initiatives include increased residential on-campus housing, a flag system where faculty can alert advisors during the semester of individual students facing difficulties, and discipline-specific peer mentoring centers for Gateway courses (freshman courses with high enrollments and high DFW rates).

To meet national goals of STEM student retention and four-year graduation, it is desirable to graduate approximately 25% of all STEM majors each year, controlling for enrollment growth and other factors. In 2008, 13% (457) of current IUPUI STEM majors received a bachelor degree. This is low when compared to the IUPUI campus average of 16% and IU Bloomington's campus average of 20%. This low percent of the IUPUI STEM student body that graduates is a result of a retention and persistence problem that begins with the first-year retention rate of 63% for STEM majors, compared to 70% for the campus; where calculus is a required course in the first-year STEM curriculum.

As IUPUI has become a more established institution, student enrollment has increased faster than the rate of university funding and departmental growth. These issues have led to limited resources such as the number of faculty and classrooms available for any one course. This has also resulted in increased section size in entry-level calculus courses over time. Specifically, the number of students enrolling in first semester calculus in the fall semester steadily increased from 271 to 362 students during this six-year study, while the number of faculty and the number of rooms available to teach mathematics on campus has remained fixed at 6 each semester. This problem increases when considering the total enrollment in all mathematics courses, which has grown from 5,928 in 2005, to 7,643 in 2014 (a 29% increase in 10 years) − making the classroom and faculty shortage growing problem. Therefore, the investigators of this study, with support from the NSF's STEM Talent Expansion Program (STEP), explored pedagogical methods to improve student success in large-enrollment sections of calculus to, thereby, increase first-year retention and, in turn, raise graduation rates in STEM related departments. Specifically, the primary goal of the STEP project is to increase the number of undergraduate STEM degrees awarded at IUPUI by 10% per year for five years (an increase of an additional 782 STEM graduates by 2015). Therefore, to meet this goal, the investigators of this study looked for ways to increase student success in calculus by examining how students learn mathematical concepts.

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Rationale and Design of the VGNA Concept Activities

Basis in Learning Strategies

Calculus concepts are often taught primarily through algebraic representations. The typical student learns how to manipulate functions algebraically to solve the vast majority of calculus problems that would appear on a test. If a student becomes proficient at algebraic manipulation, often referred to as "plug-and-chug," the student will pass the course and be promoted to the next course in the sequence. However, this traditional way of understanding calculus via algebraic representation is limiting, often missing the big ideas of calculus and, thereby, reducing its problem solving nature to plug-and-chug assignments.

Likewise, a purely algebraic approach may fail to account for the complexity of the cognitive processes by which students learn calculus. A student's way of thinking is influenced by how the student develops an understanding of the content. In particular, effective ways of thinking develop through a learning approach undergirded by the principle that students need intellectual stimulus, or what Harel (1997) has termed, the Necessity Principle. Once an intellectual need relative to a mathematical concept is established, an understanding of that concept begins. Purely algebraic conceptual representations may fail to adequately establish this "need" in all learners. Moreover, students' ways of thinking influence how they understand concepts. A way of understanding a concept in a mathematics course is part of a student's "concept image." Concepts images — the intellectual representations of concepts whether correct or incorrect — are developed through multiple perspectives, and have profound effects on comprehension (Tall & Vinner, 1981; Vinner, 1992; Harel, 1997). To ensure that valid calculus concept images are constructed, multiple representational forms should be utilized in ways that both correct faulty mental pictures of concepts and construct sound mathematical frameworks.

Therefore, the challenge is to teach calculus concepts via multiple representations, so that students learn multiple ways of describing a concept (Douglas, 1986; Gehrke & Pengelley, 1996; Goerdt, 2007; Pilgrim, 2010; Ross, 1996; Smith, 1994, 1996; Stewart, 2012; Tucker, 1996). Through multiple representations the student develops and inculcates a conceptual understanding, which will have a profound effect on comprehension and problem-solving ability (Harel, 2004). Not surprisingly, current and preceding Calculus education reforms have identified the importance of addressing issues in the learning of Calculus from multiple representations. For this reason, the VGNA Concept activities were implemented into the large lecture section's recitation periods during Phase 3. Since the 1989 Tulane Conference, Calculus reform has been concerned with, amongst other things, "numerical, graphical, and modeling problems through the use of computers, open-ended projects, writing, applications and cooperative learning" (Ganter & Jiroutek, 2000). The VGNA Concept model seeks to address these concerns of the reform movement.

The individual representations of the VGNA Concept model have been met with some success. For example, the discussion (verbal) that occurs in recitation groups regarding calculus problems has, in some studies, been shown to improve student achievement (Norwood, 1995; Bonsague, 1994; Treisman, 1985). Additionally, the use of writing (placing your verbal understandings in writing) in assignments throughout the curriculum has been growing based on research-based recommendations and assumptions — first published in a large-scale study of British schools by Britton et al. (1975) — that writing is important not only for communication

but also for the discovery of ideas and a holistic understanding of a subject. Writing in calculus courses has also been shown to promote the construction of conceptual understandings and new knowledge (Beidleman, Jones, & Wells, 1995; Cooley, 2002). Student learning has also been demonstrated through the implementation of graphical or geometric representations and the discussion of those forms (Weller et al., 2003; Monk & Nemirovsky, 1994). The use of graphical representation is a key organization and learning strategy of many students; however, in calculus except to draw a graph of a function or construct rectangles under a curve to approximate area, the geometric arguments taught to students are minimal. Additionally, numeric data or representation of problems is almost non-existent in the teaching of calculus; yet most real world modeling problems involve analyzing data or measurements in a table. Therefore, the teaching of calculus is primarily done with one perspective – algebraic understanding, which the authors of this study believe misses the big conceptual understandings of Calculus.

It was observed during the first two years of implementing required recitations as part of the large lecture section of the course (Phase 2) that the recitation instructors, all graduate students in mathematics, focused almost exclusively on algebraic representations of solving problems with little conceptual discussion. Furthermore, many of the students in these recitations were observed in a passive learning mode. The inclusion of collaborative activities in recitation grows from educational theory that group work necessarily involves the articulation of goals as well as ideas, and that these meta-cognitive activities improve learning and retention (Hillocks, 1986; Bruffee, 1984). Academic environments that are more competitive than collaborative, and those that rely on student learning occurring "spontaneously" during lectures, have been associated with "decreased interest or disaffection resulting in little or even regressive change" (Bonsangue, 1994, 121). Significant studies have demonstrated that mathematics students placed into recitation-type collaborative groups experience greater academic success (Bonsangue, 1994; Springer et al., 1999; Herzig & Kung, 2003). Similar successes have also been documented in other STEM fields. Collaborative work on physics "tutorials" has been well documented by the University of Washington group (McDermott, 1994). In chemistry, Peer-led Team Learning is a well-established methodology based on small-group activities performed in recitation sections facilitated by perr mentors (Gosser, 1998). In an attempt to redesign the recitations into an active learning modality focused on forming conceptual understandings via multiple representations, a set of weekly VGNA Concept activities were developed for and implemented in Phase 3.

The VGNA concept activities were designed to 1) place the student in an active learning mode; 2) be done in groups of three or four students; 3) focus on conceptual understandings via multiple representations; and 4) take about 40 minutes to complete (half of the allotted time for each recitation session). The concept for each week's VGNA Concept activity was selected from the lectures corresponding to the same week. The activities were adopted and adapted from the course textbook's resource manual (Shaw, 2012). An example of one such activity follows.

Example: The Chain Rule (Chapter 2.5)

The VGNA Concept activity on the Chain Rule was designed to provide a justification of the Chain Rule — by interpreting derivatives as rates of change — and opportunities to use it in computing derivatives. During lecture, the students were presented two forms of the Chain Rule:

$$(f(g(x)))' = f'(g(x))g'(x) \quad and \quad (dy/dx) = (dy/du)(du/dx).$$

The activity begins with the students in each group discussing whether these two equations say the same thing. The students are directed to describe the equations in their own words and create a **verbal** representation (explanation) for their comparison. Each groups' verbal representations will eventually be shared with the entire class. Next the students are given a graph of two functions, f and g, and asked to graph the composite function, $h(x) = g(f(x))$, and find its derivative at several points based on the **graphical** estimation of the slope of the tangent line (the algebraic formulas are not given). The students are then asked to justify the Chain Rule with a geometric argument. The students are then given a table of **numeric** values (see Table 1) to determine the derivative of various composite functions using f and g.

Table 1

Numeric Values of Functions used in VGNA Concept Activity on the Chain Rule

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
1	3	2	4	6
2	1	8	5	7
3	7	2	7	9

The activity concludes with the students finding derivatives of functions in **algebraic** representations. On all VGNA Concept activities, the algebraic representation is always done last. The activities are collected and graded, one score per group.

A quiz at the end of the recitation session provides formative evaluation to the recitation instructor about the level to which students have inculcated the activity's conceptual understandings. Two questions on the quiz that have proven insightful in assessing conceptual and notational understanding is:

(1) Compute: $(d/dx) \sin x^2$ and $(d/dx) \sin^2 x$.

(2) Where do you stop when using the chain rule? Explain why this is false:
$(d/dx) \sin(x^4 + 3x^2) = [\cos(x^4 + 3x^2)](4x^3 + 6x)(12x^2 + 6)(24x)24.$

This VGNA Concept activity on the Chain Rule is one of the more powerful activities in the course. The activity causes a lot of discussion and arguments during recitation because it challenges the understandings of almost every student in the class, from their use of basic notation (i.e., squaring the sine function or its argument), understanding of composite functions, to why the chain rule works. Once students have actively studied the verbal, geometric, and analytic conceptual understandings, we find they are much less likely to make the common algebraic errors on tests (Watt, 2013), leading to lower DFW rates, and higher one-year retention rates, as evidenced by the results of this study.

Methodology

The study involved 1,956 calculus students who, over a six-year period (three two-year phases), enrolled into either a small section of calculus or the large lecture section (see Table 2). The small sections of the calculus course had enrollments below 50 students per section (average was 46) with a traditional style of classroom presentation and discussion format. The large

lecture section of the course had enrollments averaging 92 students per section, with additional recitation sections of 25 students per recitation.

Table 2

Breakdown of Students by Phase and Section Size

Phase	Small Section Control	Large Section Treatment
I	450	130
II	463	213
III	490	210

The recitation format evolved over time, but can be divided into three distinct phases lasting two years each. During Phase I (2007 and 2008), the students in the large lecture section (like all students in the course) had optional mentoring sessions at the Math Assistance Center conducted by undergraduate students (peer mentors). During Phase II (2009 and 2010), the students had required mentoring sessions (recitations) conducted by graduate students. A quiz was administered during recitation, and the score became part of the course grade. During Phase III (2011 and 2012), newly created recitation activities focused on developing mathematical concepts via an integrated Verbal, Geometric, Numeric and Algebraic understandings approach (VGNA Concept activities). These VGNA Concept activities were collected, graded, and became part of the course grade.

Participants

The students who enroll in the calculus course are predominately majoring in engineering, physical sciences, or mathematical sciences. They either place directly into the course from the Compass Math Placement Test (developed by ACT) or completed the pre-calculus course with a grade of C or better. In the fall semester, the majority of these students are freshman, and they are not likely to be familiar with the instructors or their methods of teaching when they register for the course. Therefore, the study only examined the fall semester over six years in an attempt to control for student selection patterns when registering and to more easily determine first-year retention rates. In addition, the student demographics were similar in all sections of the course (see Table 3).

Table 3

Student Demographics

	Female	Minority	Freshman	Engineering	Science
Control	19%	15%	68%	58%	30%
Treatment	17%	16%	72%	59%	31%

Recitation Designs in the Large-Enrollment Section

As discussed earlier, IUPUI has experienced an increase in the number of students taking first semester calculus during the fall semester — from 220 in 2002, to 362 in 2012 (a 60% increase). However, the number of sections of the course remained constant at six because of faculty and classroom limitations. The department was able to secure one time slot in the lecture hall for one section of the course, and the increased enrollment each year was absorbed by this lecture hall section. The same tenured faculty member taught the large-enrollment section every fall semester during this study. In an attempt to allow students in the large-enrollment section an opportunity to ask questions and receive individual attention, various interventions were implemented in three phases (each phase was used for a two-year period of time). The recitations were led by graduate students in mathematics (16 total), all of whom took the department's TA Workshop required of all graduate students teaching in the department – no graduate student was used for a second year in this study (the author was interested in how the VGNA Concept activities would be adoptable by new graduate students every year).

Control Group

The control group was the small-enrollment sections of the course in aggregate, comprised of five such sections every semester, each with fewer than 50 students. The student demographics of the control group are comparable to that of the large-enrollment section, except for 17 registered graduate students, of which none were enrolled in the large-enrollment section of the course. There were eight different instructors of the small-enrollment sections during the study (four were associate professors who taught one section every semester of the study) — all but two were tenured faculty (each teaching once during the study). Therefore, the authors assumed the majority of the teaching in the control group was performed by experienced professors who have taught the course multiple times.

Table 4

Type of Faculty Teaching Sections of the Course

Faculty	Ph.D. Cand	Assistant	Associate	Full
Control	1	1	4	2
Treatment	0	0	1	0

Assessment Instruments

Three measures were used to assess student success in the calculus course: the department final examination scores, the DFW rate, and the one-year retention rate after taking the calculus course. The DFW rate for the course, or a section of the course, is determined by dividing the number of students receiving a course grade of D, F, or W (withdrew from the course) by the number of students enrolled in the course at census. A freshman-level or general education course with a DFW rate above 30% is considered an at-risk course by University College (the freshman advising unit) for students at IUPUI. The majority of freshman-level mathematics courses (13 out of 22 in 2010) were considered at risk for freshman at IUPUI.

The departmental final examination is written each year by the coordinator of the course (who did not teach the course during the period of this study). The exam is a paper-and-pencil open-response instrument, with the same number of items testing the same learning objectives each year. The instructors of the course do not see the final examination until the day of the exam. Students from all sections of the course take the departmental final examination at the same time and place during final exam week. The exams are then commonly graded (each instructor of the course grades one page of the exam, for all students in the course).

Results

For this analysis, an ANOVA test was run, using SPSS (Version 21.0), linear and logistic regressions were constructed to compare the control and treatment groups during the three phases of the research, no other explanatory variables were considered. The regression models looked at each phase of the research to determine differences in final exam scores, DFW rates, Calculus II pass rates, and student retention in STEM majors based upon the Calculus I enrollment section type. Figure 1 shows the mean final exam score by phase and section type. During Phase I, there was no statistical difference between the two sections types ($p = .632$). In Phase II ($p<.001$, $t=3.546$) and Phase III ($p<.001$, $t=8.042$), the treatment group performed significantly better than the control group on the course final exam. Additionally, the change in final exam scores from Phase I to Phase II ($p < .01$, $F=8.503$), and Phase II to Phase III ($p = .018$, $F=5.620$), demonstrated significant growth within the large enrollment section.
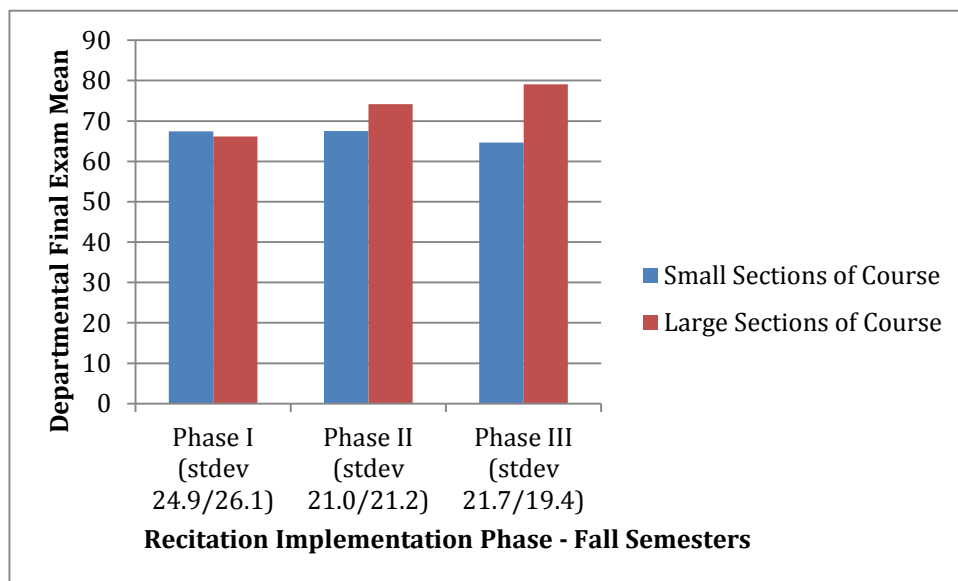
Figure 1. Results from departmental final examination, mean (stdev) by type of section.

When examining the DFW rates, the treatment group has always had a smaller DFW rate than that of the control group (see Figure 2). However, this difference was not statistically significant ($p<.05$) until Phase III [$p<.01$, Exp(B)=1.668]. This finding is also consistent with the STEM majors in the course. As with the entire course population, the DFW rates for STEM majors in the treatment group were higher throughout each phase (see Figure 3), yet the difference was only statistically significant in Phase III [$p=.01$, Exp(B)=1.641].
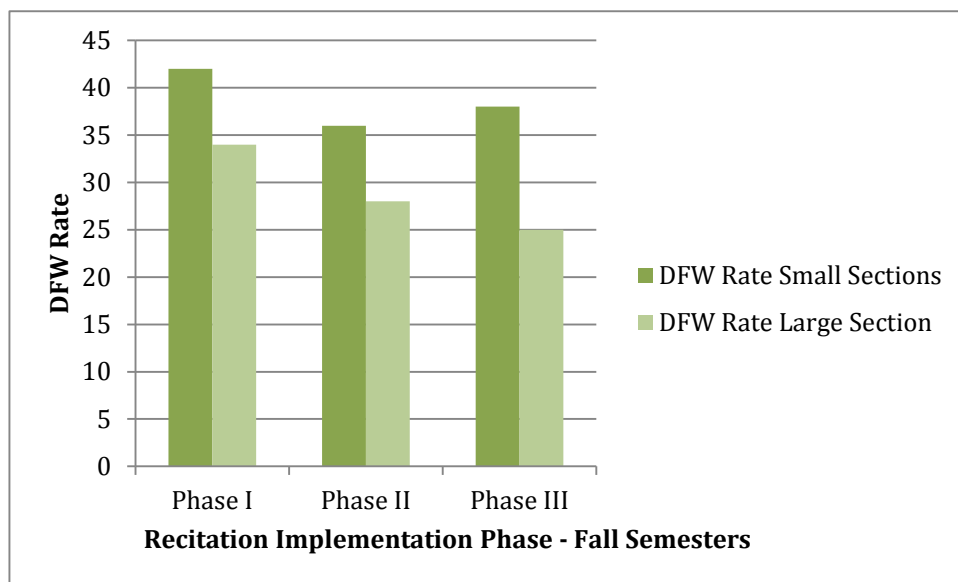
Figure 2. Results from DFW rates by type of section for all majors.
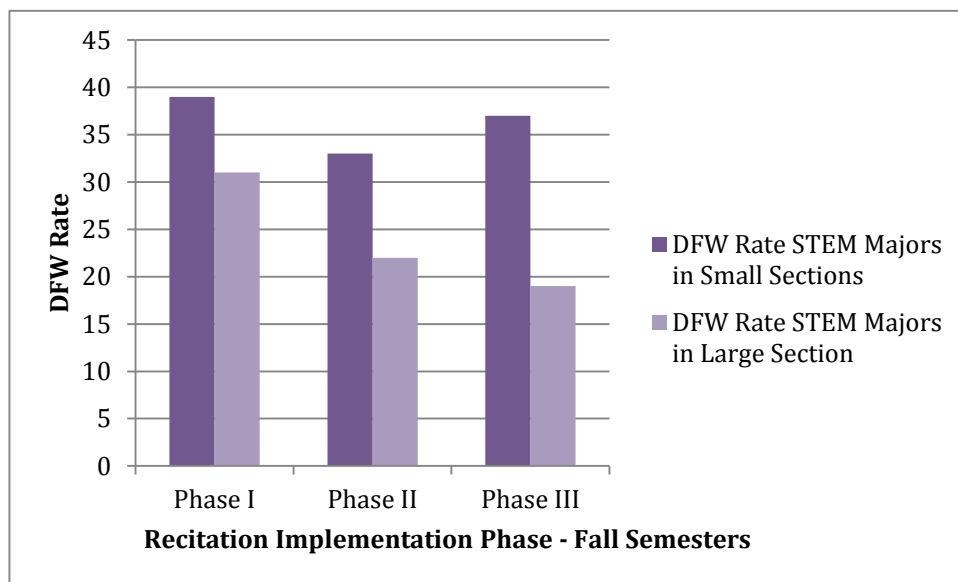
Figure 3. Results from DFW rates by type of section for STEM majors only.

Student success in the follow-up course, Calculus II, was analyzed to see if there was a difference between the control and treatment groups during the three phases of implementation. Figure 4 shows the Calculus II passing rates of students, from each section type, who passed Calculus I. Students from Phase I, who were in the control group had a higher passing rate in Calculus II than the treatment group, but the difference was not statistically significant (p=.584). For Phase II, students involved in the treatment group had a higher Calculus II pass rate than the control group, but as in Phase I the difference was not significant (p=.227). However, in Phase

III, the difference between the control and treatment group increased creating a statistically significant difference [p<.001, Exp(B)=2.215].
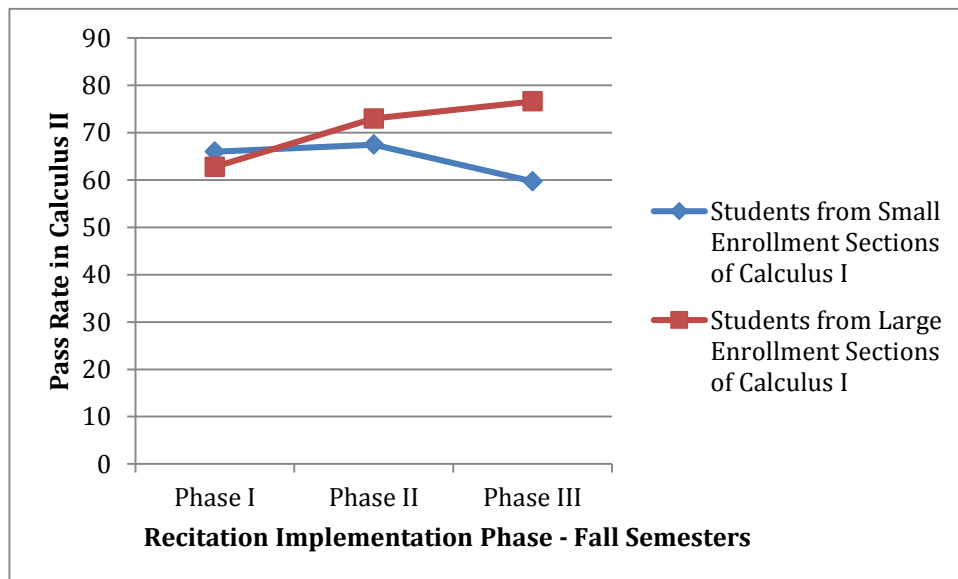
Figure 4. Pass rates (C or better) in Calculus II based upon Calculus I enrollment size.

Figure 5 shows the retention rates for direct admit STEM majors from first to second year by Phase and section type. While the treatment group maintained a higher retention rate throughout all three Phases, the difference was not statistically significant throughout Phases I (p=.471) and II (p=.089). However, with the implementation of the VGNA model in Phase III, there was a statistically significant difference between the enrollment sections [p<.001, Exp(B)=3.87].
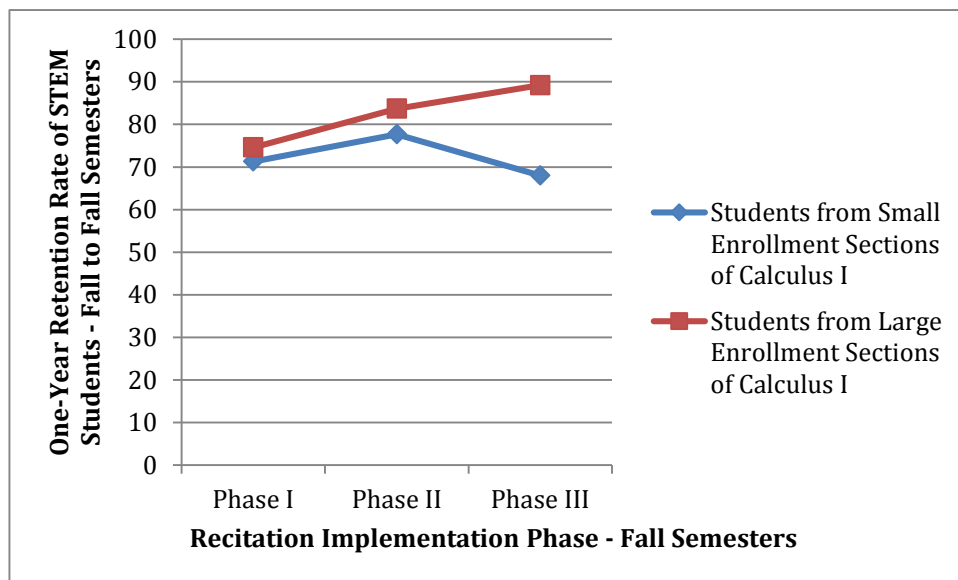
Figure 5. STEM one-year retention rates of direct admit STEM majors.

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Discussion

The purpose of this study was to evaluate the effects of implementing recitations in a large-enrollment section of calculus on departmental final exam scores, DFW rates, and one-year retention rates of students in STEM majors. Over a six-year period, three phases of different recitation formats were studied and the results were compared to the small-enrollment sections of the course.

Department Final Examination Scores

The results suggest that students performed better on the final examination when recitations were required. This is attributed to the fact that student-learning outcomes increase with more active learning, which is more likely to occur in recitations than small or large enrollment classes. Hence, students required to attend recitations outperformed the control groups in Phases II and III and the students in the large enrollment class during Phase I, where recitations were optional.

There was a significant increase in student performance on the departmental final examination when VGNA Concept activities were added to the required recitations. Pedagogically, this was not surprising. When students are placed in an active role in developing their conceptual understandings via multiple perspectives (verbal, geometric, numeric, as well as algebraic), they are more likely to inculcate the concept at higher levels and, therefore, more likely to solve routine problems with higher proficiency and to apply the concept to new situations (increased problem solving).

In order to determine if the increase in final exam scores during Phase III might be a result of the final exam questions evolving to favor the treatment group over time (assessing more conceptual understanding of the content), a review of the final exam questions was performed to determine if the number, type, or difficulty level of the questions had changed over the three phases of this study. A faculty member who teaches calculus at another institution performed this review. It was determined that the number of questions did vary each year, but the concepts being tested and the method of assessing these concepts was identical every year; in addition, the difficulty level of those questions was consistent.

DFW Rates

When using DFW rates to measure student success, it is important to note that this rate is partly instructor specific; however, the DFW rate of any one instructor of the course did not vary more than 6 percentage points. An instructor's rate tended to be higher when given more than 40 students in a section, but the correlation of DFW rate to class size was not statistically significant. Between the two factors, the DFW rate is more instructor specific and less dependent on class size. This probably accounts for why department chairs often assign large-enrollment sections to instructors with overall low DFW rates.

Student success increased as students were placed into more structured and active learning modes. Using DFW rates as a measure of student success, the small-enrollment sections of the course fluctuated between 35% to 44% over the six-years, averaging 39%. In the large-enrollment sections, the DFW rates were the highest (35%) in Phase I when students were passive learners in watching the lecture and not required to attend recitations. In Phase II, the

DFW rate dropped to 29%, when students were required to attend a recitation focused on placing them in a more active learning mode. In Phase III, the DFW rate dropped to 26%, when the VGNA Concept activities were implemented.

An important observation of the study is the comparison of the DFW rates between STEM majors and the entire population with respect to the recitation type. For the control group (small enrollment sections), the difference in the DFW rate between the STEM majors and entire population was never greater than 4 percentage points for all three phases of the study (not statistically significant). However, for the large enrollment sections during Phase III (both years), the DFW rates were 7 percentage points lower for the STEM majors when compared to the entire population in the same section. This finding that STEM majors (more so than other types of majors) are more likely to pass the course when the VGNA Concept activities were implemented has serious teaching and learning implications for retaining STEM majors.

Pass Rates in the Next Course

The effect of the VGNA Concept activities on student success goes beyond the first course in the Calculus sequence. All of the students in this study were tracked into the second course, where the grades from the two courses were compared for each student. The second semester calculus course does have small and large enrollment sections, and the large enrollment sections of the second course do have required recitations conducted by graduate students; however, the VGNA Concept activities were not integrated into the second course during the period of this study. Like most institutions, students are able to register for any section of the course – about 62% of the students in the large lecture section in the fall selected the large enrollment section for the second course.

In Phase I and II, there was no significant difference in the pass rate (grades of A, B, or C) in the second course of those students who passed the first course, between control and treatment groups. However, in Phase III, the difference became significant, with those students in the treatment group (large enrollment sections using the VGNA Concept activities) passing at a rate 15-percentage points higher than the control group. In addition, the control group experienced a 6-percentage point drop in their success rate in the second course from Phase II to Phase III (there was no change from Phase I to Phase II). There may be two related dynamics that account for these observations in success rates in the second course. First, the Phase III students that participated in the VGNA Concept activities developed strong conceptual understandings, which have prepared them for future success in the second course. Secondly, the students using the VGNA Concept activities inculcated more than a strong conceptual understanding of the topics being taught; they also learned new ways of knowing or learning knowledge and then used these new ways of learning in the second course. Both of these dynamics may have placed the control students at a disadvantage in the second course, where the treatment students performed at higher cognitive levels, and the control students found it difficult to keep pace with the other students in the class.

One-Year STEM Major Retention

One of the important indicators of the number of future STEM graduates is the first-year retention rate, which sets the trajectory to graduation. IUPUI, like many institutions nationally, has more than half of its first-year STEM majors drop the program by the end of their freshman

year. Often Calculus is blamed for this problem by being a filter rather than a pump. Therefore, retaining students as STEM majors one-year after the Calculus course was of interest in this study. All of the students identified as STEM majors during the first course in Calculus were tracked one-year after the course to determine whether they remained a STEM major. During Phase I and Phase II, the difference in one-year retention rates was not significant. However, during Phase III, the treatment group was 20% more likely (88% versus 68%) to remain a STEM major. This is a significant and meaningful result. The Calculus course should adopt more active learning strategies with multiple concept representations, not only to lower DFW rates and increase future success in the Calculus sequence, but to also retain more STEM majors in the first year.

Additional Notes

It should be noted that the 2011 control cohort had one section taught by a graduate student. This cohort was considered an outlier, affecting two of the control group's mean scores for that year. The mean scores affected were: (1) a lowering of the pass rate in the second calculus course, and (2) a lowering of the one-year retention rate. The authors concluded this was the result of an inexperienced teacher (graduate student), who either did not focus enough attention on the key concepts, did not set expectations high enough, or did not pace the course correctly (all common issues for inexperienced teachers). This resulted in too many students not being prepared for the next course. This is noted for the possible implications of assigning inexperienced teachers to the first course in Calculus. When the data from the 2011 control cohort taught by a graduate student was excluded from the analysis, the statistics did not significantly change the results or conclusions from Phase III, which combined all the control sections over a two year period).

Implications for Future Study

From a broader perspective, the primary goal of the STEP project is to increase the number of STEM graduates. However, the participants in the first phase of the study are just now reaching their six-year graduation date, so it will be several more years before this goal can be measured on all students participating in the three phases. In the meantime, students are being tracked into second and third year courses where there is an attempt to measure the effectiveness of the VGNA Concept activities on student success and retention. Specifically, it must be determined if students are transferring these conceptual learning strategies into other math and science courses, and if so, whether these strategies are influencing achievement levels. In addition, this study did not investigate the possible effects of VGNA Concept activities on student success and retention of students in small-enrollment calculus sections. Nor did the study take into account the effect of VGNA Concept activities on demographic characteristics of the students that participated. Further study on the impact of VGNA Concept activities on gender, students of color, stratified age groups, and STEM major would make for interesting research.

Conclusions

Over a period of six years, three different types of recitation sessions were implemented into the large enrollment section of the calculus course. Although each type of recitation session

had different pedagogical models, the time on task (classroom seat time) was the same for all phases of this study. During the fall semesters, the results on the departmental final examination, the DFW rates, and the one-year retention rates of STEM students were examined by the type of recitation session used with the large enrollment section. The three types of recitation sessions studied were: (1) optional mentoring at the Math Assistance Center conducted by undergraduate peer mentors, (2) required mentoring conducted by graduate students, and (3) required VGNA (Verbal, Graphical or Geometric, Numeric, and Algebraic) Concept activities, which were also coupled with mentoring conducted by graduate students. The success of the students in the large enrollment section of the course, which included one of the three different types of recitation sessions, was compared to the success of students in the small enrollment sections of the course. The effects of using each type of recitation session on raising departmental final examination scores, lowering DFW rates, and raising one-year retention rates were examined. This study found that the most significant increases in student learning outcomes and one-year retention rates clearly occurred in the third type of recitation, in which students were taken out of their passive learning environments and integrated into environments of active learning (e.g. group work and collaborative learning) where, through the use of the VGNA Concept activities, knowledge construction occurred.

The increase in retention, persistence, and student graduation in STEM-related majors is critical to the nation's economic well-being. It is evident to educators, employers, and politicians that more students need to become successful in flowing through the STEM pipeline. As part of this effort, the mathematics education community has been working on making calculus a pump and not a filter in the STEM pipeline for more than 25 years; however, too many students today are still not being retained in STEM disciplines because of their initial calculus course. This study has demonstrated that, even in large-enrollment sections of calculus, the implementation of highly structured recitation activities that focus on placing the student in an active role of developing their conceptual understandings of mathematics via verbal, geometric, numeric and algebraic representations can increase the student success rate in calculus and increase the first-year retention rate for STEM students. In time, it is expected that these increases will have an effect on the number of students completing a STEM degree — flowing from the pipeline and into the economy.

References

Beidleman, J., Jones, D., & Wells, P. (1995). Increasing students' conceptual understanding of first semester calculus through writing. *Primus, 5*(4), 297-316. doi: 10.1080/10511979508965795

Bonsangue, M. (1994). An efficacy study of the calculus workshop model. In Dubinsky, A. Schoenfeld, & J. Kapuut (Ed.), *CBMS Issues in Mathematics Education Volume 4: Research in Collegiate Mathematics Education I* (pp. 117-137). Providence: AMS.

Britton, J., Burgess, T., Martin, N., McLeod, A., & Rosen, H. (1975). *The development of writing abilities (11-18).* London: MacMillan Educational for the Schools Council.

Bruffee, K. A. (1984). Collaborative learning and the 'Conversation of Mankind'. *College English, 46*(7), 635-652. doi: 10.2307/376924

Watt, J.X., Feldhaus, C.R., Sorge, B.H., Fore, G.A., Gavrin, A.D., & Marrs, K.A.

Budny, D., LeBold, W., & Bjedov, G. (1998). Assessment of the impact of freshman engineering courses. *Journal of Engineering Education, 87*(4), 405-411. doi: 10.1002/j.2168-9830.1998.tb00372.x

Cooley, L. (2002). Writing in calculus and reflective abstraction. *Journal of Mathematical Behavior, 21*(3), 255-282. doi: 10.1016/S0732-3123(02)00129-3

Douglas, R. G. (1986). *Toward a lean and lively calculus (Vol. 6).* Washington, DC: Mathematical Association of America.

Ganter, S. L., & Jiroutek, M. R. (2000). The need for evaluation in the calculus reform movement: A comparison of two calculus teaching methods. In E. Dubinsky, A. H. Schoenfeld & J. Kaput (Eds.), *CBMS Issues in Mathematics Education Volume 8: Research in Collegiate Mathematics Education IV (pp. 42-62)*. Providence: AMS.

Gehrke, M., & Pengelley, D. (1996). Towards active processes for teaching and learning. In A. W. Roberts (Ed.), *Calculus: The dynamics of change (Vol. 39, pp. 20-23)*. Washington, DC: Mathematical Association of America.

Goerdt, S. (2007). *The effect of emphasizing multiple representations on calculus students' understanding of the derivative concept.* Ph.D., University of Minnesota, United States – Minnesota. Retrieved from http://0-proquest.umi.com.catalog.library.colostate.edu/pqdweb?did=1500055151&Fmt=7&clientId=14436&RQT=309&VName=PQD

Gosser, D. K., & Roth, V. (1998). The Workshop Chemistry Project: Peer-led team learning. *Journal of Chemical Education, 75,* 185-187. doi: 10.1021/ed075p185

Harel, G. (1997). The linear algebra curriculum study group recommendations: Moving beyond concept definition. In Carlson D., Johnson, C, Lay, D., Porter, D., Watkins, A, & Watkins, W. (Eds.). *Resources for Teaching Linear Algebra,* MAA Notes, Vol. 42, 107-126.

Harel, G. (2004). A perspective on "concept image and concept definition in mathematics with particular reference to limits and continuity." In T. Carpenter, J. Dossey, & L. Koehler (Eds.), *Classics in mathematics education research (pp. 98-108)*. Reston: The National Council of Teachers of Mathematics.

Herzig, A., & Kung, D. T. (2003). Cooperative learning in calculus reform: What have we learned? In A. Selden, E. Dubinsky, G. Harel & F. Hitt (Eds.), *CBMS Issues in mathematics education Vol 12: Research in collegiate mathematics education V (pp. 30-55)*. Providence: American Mathematical Society.

Hillocks, G. (1986). *Research on written composition: New directions for teaching.* Urbana: NCRE/ERIC Clearinghouse on Reading and Communication Skills.

Watt, J.X., Feldhaus, C.R., Sorge, B.H., Fore, G.A., Gavrin, A.D., & Marrs, K.A.

McDermott, L. C., Shaffer, P. S., & Somers, M. D. (1994). Research as a guide for teaching introductory mechanics: An illustration in the context of the Atwood's machine. *Am. J. Phys., 62,* 46-55. doi: 10.1119/1.17740

Monk, S., & Nemirovsky, R. (1994). The case of Dan: Student construction of a functional situation through visual attributes. In E. Dubinsky, A. H. Schoenfeld, & J. Kaput (Eds.), *CBMS Issues in mathematics education volume 4: Research in collegiate mathematics education I (pp. 139-168).* Providence: American Mathematical Society.

Norwood, K. (1995). The effects of the use of problem solving and cooperative learning on the mathematics achievement of underprepared college freshmen. *Primus, 5,* 229–252. Doi: 10.1080/10511979508965789

Pilgrim, M. E. (2010). *A concepts for calculus intervention: Measuring student attitudes toward mathematics and achievement in calculus.* Unpublished doctoral dissertation, Colorado State University, Fort Collins.

Ross, S. C. (1996). Visions of calculus. In A. W. Roberts (Ed.), *Calculus: The dynamics of change (Vol. 39, pp. 8-15).* Washington, DC: Mathematical Association of America.

Smith, D. (1994). Trends in calculus reform. In A. E. Solow (Ed.), *Preparing for a new calculus (Vol. 36, pp. 3-13).* Washington, DC: Mathematical Association of America.

Smith, D. (1996). Thinking about learning, learning about thinking. In A. W. Roberts (Ed.), *Calculus: The dynamics of change (Vol. 39, pp. 31-37).* Washington, DC: Mathematical Association of America.

Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on under-graduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research, 69,* 21–51. doi: 10.3102/00346543069001021

Stewart, J. (2012). *Calculus, 7th Edition.* Belmont, CA: Brooks/Cole.

Shaw, D. (2012). *Instructor's guide for calculus, 7th Edition.* Belmont, CA: Brooks/Cole.

Steen, L. (Ed.). (1988). *Calculus for a new century: A pump, not a filter.* MAA Notes No. 8. Washington, DC: Mathematical Association of America.

Tall, D., & Vinner, S. (1981). Concept image and concept definition in mathematics with particular reference to limits and continuity. *Educational Studies in Mathematics, 12*(2), 151–169. doi: 10.1007/BF00305619

Treisman, P. M. (1985). *A study of the mathematics performance of black students at the University of California, Berkeley.* Unpublished doctoral dissertation, University of California, Berkeley.

Tucker, T. (1996). Nonalgebraic approaches to calculus. In A. W. Roberts (Ed.), *Calculus: The dynamics of change (Vol. 39, pp. 16-19).* Washington, DC: Mathematical Association of America.

Vinner, S. (1992). The function concept as a prototype for problems in mathematics learning. In *The concept of function: Aspects of epistemology and pedagogy,* edited by Guershon Harel and Ed Dubinsky, pp. 195–214. Washington, D.C.: Mathematical Association of America.

Watt, J. X. (2013). *CI-STEP: Transforming the calculus course to increase STEM graduates.* Proceedings of the 2013 International Conference on Mathematics Education (2013. 11. 1-2) 635-645.

Weller, K., Clark, J., Dubinsky, E., Loch, S., McDonald, M., & Merkovsky, R. (2003). Student performance and attitudes in courses based on APOS theory and the ACE teaching cycle. In A. Selden, E. Dubinsky, G. Harel, & F. Hitt (Eds.), *CBMS Issues in mathematics education Vol 12: Research in collegiate mathematics education V (pp. 97-131).* Providence: American Mathematical Society.

Wieschenberg, A. A. (1994). Overcoming conditioned helplessness in mathematics. *College Teaching, 42*(2), 51–54. doi: 10.1080/87567555.1994.9926820

"Who am I to bring diversity into the classroom?" Learning communities wrestle with creating inclusive college classrooms

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Abstract: This study explored the experiences of gateway course instructors during the implementation of pedagogical changes aimed at improving the success of diverse students. A detailed case study was built through analysis of peer observations, focus groups, oral and written reflections, student grades, in-depth interviews, and pre and post student surveys. Results showed that instructors faced three major challenges in implementing pedagogical changes: pragmatic challenges, student-centered challenges, and challenges to instructor self-concept. Embracing a learning paradigm and participating in a learning community helped instructors to manage these challenges as they worked to create more inclusive learning environments for students.

Keywords: diversity, inclusive pedagogy, learning communities, reflective practitioner, culturally responsive pedagogy

This study is the outgrowth of a faculty development effort by our university to increase the use of learner-centered, culturally responsive pedagogies by instructors on our campus. Gay (2000) defines culturally responsive teaching as using the cultural knowledge, prior experiences, and performance styles of diverse students to make learning more appropriate and effective for them; it teaches to and through the strengths of these students. The ultimate goal of the faculty development effort was to improve the academic success and retention rates among first-generation and minority college students who, on our campus and others, have historically encountered greater challenges in completing their degrees (Cooper, 2010).

In this case study, we describe one intervention, a Gateway Success workshop designed to increase the use of these teaching strategies, and explore the experiences of instructors working to change their courses. Exploring this issue led not only to the discovery of several common challenges, but also to the finding that learning communities seemed to help instructors to manage these challenges.

Literature Review

Previous research suggests that culturally responsive pedagogies can improve outcomes for all students, but especially for students in these high-risk groups (Nelson, 1996; Richards, Brown, & Forde, 2007; Steele, 2010); however, these strategies are not widely used (Sleeter, 2012). If higher education is to increase the use of culturally responsive pedagogy and other research based instructional strategies in higher education, there must be a greater understanding

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of the obstacles individual instructors face in implementing changes to their courses. Amundsen and Wilson (2012) note, "At this point in time, we know more about how to design educational development initiatives to improve individual teaching practice but less about how this learning is actualized and embedded in the academic workplace" (p. 111).

Encouraging Pedagogical Change

One of the difficulties faced by many college and university instructors is that they have little to no background in teaching strategies. Knobloch and Ball (2006) suggest, "Few professors have actually been taught how students learn and how to best teach their students" (p. 4). This is perhaps especially true of culturally responsive teaching strategies. In fact, many professors have learned their teaching strategies by observing their own college instructors' use of direct instruction centered in a teacher led model. Demir, Sutton-Brown, and Czerniak (2012) writing about science and mathematics professors in particular, argue faculty are often not equipped to be critical about their teaching because, unlike their colleagues in elementary and secondary education, most have no formal preparation for teaching. Mostly, they rely on their past experience in the way they were taught … and college-level teaching becomes on-the-job training taking place without help and resources (p. 1070).

Barr and Tagg (1995) argue that the switch to learner-centered pedagogy requires a complete paradigm shift from an "Instruction" paradigm to a "Learning" paradigm. In this change process, instructors take on the role of both teachers and learners which often requires a major reconceptualization of teaching and learning. Such a transformation requires increased knowledge of teaching strategies, desire to change, and willingness to put more time and energy into teaching (Knobloch & Ball, 2006).

Often the faculty development process is initiated by a workshop in which instructors learn about new teaching strategies; however it is clear that workshop participants are not always able to execute recommended instructional changes (Amundsen & Wilson, 2012). In fact, such programs can increase the number of faculty who initially try new teaching strategies, but many who begin to use these strategies during these implementation efforts cease using them soon afterwards. In their survey of 722 physics instructors, Henderson, Dancy, and Niewiadomska-Bugaj (2012) found that approximately one-third of faculty discontinued using research-based instructional strategies after trying them for the first time. Glowacki-Dudka, Murray, and Concepcion (2012) found that a workshop series on inclusive pedagogy inspired some instructors to change their courses. They also argued, however, that for ongoing instructor learning, instructors could benefit from more opportunities for group reflection and dialogue about their course changes. One such faculty learning community, which met biweekly for an extended period of time, resulted in implementation of pedagogical changes that were highly rated by a diverse group of students and may also have increased student success (Smith et al., 2008).

The role of reflection and dialogue is especially important when the pedagogical change being sought is increased use of culturally responsive pedagogies. A major goal of culturally responsive pedagogy is not only to affirm cultural identities but also to help develop critical perspectives that challenge the inequities schools and other institutions perpetuate (Ladson-Billings, 1999). In order to develop critical perspectives in students, instructors need to adopt critical perspectives themselves. Richards, Brown, and Forde (2007) note "by honestly examining their attitudes and beliefs about themselves and others, teachers begin to discover why they are who they are, and can confront biases that have influenced their value system" (p. 65). Through this reflective process, teachers learn how to determine the multicultural strengths and

weaknesses of curriculum designs and instructional materials and make the changes necessary to improve their overall quality (Gay, 2000).

Previous research suggests that in order to promote long term changes in instructional practices, faculty development strategies should involve more than just a one-time workshop; rather, they should be longer term, at least one semester (Henderson, Beach, & Finkelstein, 2011), encourage instructor reflection and coherence with instructor teaching philosophy and beliefs (Richards, Brown, & Forde, 2007), and include institutional support (Demir et al., 2012). In this paper, we report on an initiative that featured all of these components and explore the following research question: what is the experience of instructors changing their courses to create a more culturally responsive classroom? Exploring these experiences using research based practices for faculty development can help us to understand how to encourage the transformation required for meaningful adoption of culturally responsive pedagogies.

Research Methodology

Participants in the Gateway Success Faculty Development Process

Recognizing that the change process often begins when a desire for change meets new knowledge, our university has developed its own "Gateway Success" initiative which educates instructors about the unique challenges faced by diverse students in introductory (or gateway) courses and encourages them to adapt their pedagogy accordingly. As part of this initiative, a two day workshop on inclusive teaching strategies and student success was offered for instructors who were interested in making changes to their courses to better serve diverse students. During the workshop, instructors participated in discussions of inequities experienced by first generation and minority students, read about high impact practices, and developed action plans for their courses. The instructors had to agree to make a significant change to increase the success of diverse students in their course over the year following the workshop, and were provided a $500 stipend for doing so. Although this was a moderate stipend, it acknowledged the time and energy needed to make such changes in the course. This type of institutional recognition for the challenges inherent in making course changes is an important part of increasing the use of culturally responsive pedagogies (Demir et al., 2012).

Following the gateway success workshop, instructors were recruited for this study via e-mail and all agreed to participate. The seven instructors in the study taught in the areas of English, History, and Psychology. All were experienced instructors with several years of teaching experience. Instructors of both small (25 students) and large (100-250 students) gateway courses were included in the sample.

Data Collection

All research procedures were reviewed by the university's review board for protection of human subjects. In order to encourage reflection and continuous learning, the project used the instructors' action plans, structured reflections, in-depth interviews, classroom observations, and discussions within a learning community of instructors before, during, and after instructor interventions. Each instructor participated in an interview (average length of 45 minutes) before the semester began where they discussed goals and expectations for their courses. During the semester, peer observations by researchers were conducted to observe how the instructors were incorporating pedagogical and/or curricular changes in the classrooms. At the end of the

semester, instructors were interviewed about their learning processes and the results of course changes (average length of 30 minutes). In addition, most of the instructors also participated in at least one focus group (one held mid-semester, one held post-semester) about their experiences. During interviews, instructors were asked to describe the following: their confidence as an instructor; motivations for changing the course; goals for their changes; plans for, implementation of, and outcomes (areas of difficulty and accomplishments) from the instructional changes.

The interviews and focus group recordings were transcribed for analysis yielding 161 single-spaced pages of transcript. In addition to the transcripts, several additional written documents were reviewed. These included the action plans written at the beginning of the semester detailing course changes and a summary of the researchers' peer observations. Some instructors also submitted periodic written reflections on their course changes.

All transcripts and action plans were uploaded into Atlas.ti, a qualitative software analysis program. This program was used to sort, separate, and categorize the various data sources using the constant comparative method of data analysis (Strauss & Corbin, 1990). This initial analysis revealed that although instructors used a wide variety of teaching strategies to make their classes more inclusive (11 emerged from our initial coding), the process of changing the courses generated both challenges and successes. To interrogate these challenges and successes in more depth, the data were subdivided and each research team member independently reviewed two interview transcripts focusing on the three key challenges found in the data. Notes were made on the major subcategories associated with the primary challenges and then discussed by the group.

Results and Discussion

Pedagogical changes

The action plans showed that the workshop inspired the instructors to use a wide variety of strategies in an effort to make their classes more inclusive and increase their alignment with culturally responsive pedagogy. Examples are listed in Table 1. All of these pedagogical changes were undertaken with the goal of making students feel more accepted in the classroom

Table 1

Pedagogical strategies used by participants

Aspect of course	Examples
instructor-student interaction	holding individual meetings with students
	providing more frequent feedback to students
content	materials expressing a wide variety of perspectives
	explicit discussion of issues of diversity and white privilege
	encouraging students to make connections between courses
classroom activities	taking attendance
	introductory icebreaker activities
	collaborative learning assignments
	clicker questions
	student led discussions
	written reflections

and increasing student achievement. Data collected to measure the effect of the pedagogical changes upon the students found a decrease in failing and withdrawal rates in the larger courses, and a very positive perception of classroom climate in the smaller courses, suggesting that the changes were at least somewhat successful in meeting the stated goals of the instructors.

Challenges and Successes

The analysis revealed that regardless of class size, instructor experience, or course content, instructors all experienced similar challenges and successes related to incorporating more culturally responsive and learner-centered pedagogy. These appear in Table 2. The interviews and focus group exposed difficulties faced by instructors and allowed discussion of these challenges and their management skills. In short, these conversations provided a more comprehensive understanding for the implementation process in the "academic and social context" where faculty actually work (Amundsen & Wilson, 2012, p. 111).

Table 2

Common experiences during course transformation process

Type of experience	Examples
challenging tasks	incorporating/representing multiple perspectives
	facilitating discussions
	assessing student work
enabling factors	instructors viewed themselves as students
	embraced developmental perspective of change
	support from other members of learning community

Despite significant obstacles to course transformation, all instructors felt positively about the Gateway Success faculty development process. They had increased their knowledge of students' backgrounds and cultures, which is a fundamental first step to implementing culturally responsive pedagogy (Adams, 1992). They had also adopted more critical perspectives of their own teaching practices, attitudes, and beliefs which will enable them to confront and continue to challenge their own biases (Gay, 2000; Richards, Brown, & Forde, 2007). Furthermore, instructors were committed to continuing to implement changes to transform their teaching. Instructors' comments also suggested two common reasons for their perseverance: (1) they viewed themselves as students and embraced a developmental perspective of change, and (2) they felt supported by other members of the learning community.

Multiple Perspectives

In her article "Promoting Diversity in College Classrooms: Innovative Responses for the Curriculum, Faculty, and Institutions" (1992), Adams acknowledges four dimensions of teaching and learning that are central to issues of social and cultural diversity. The first of the dimensions is: Knowing one's students and understanding the ways students from various social and cultural background experiences the classroom (p. 10.) A key finding in this research was that the training workshop in culturally responsive pedagogy led to an increase in instructor awareness of the varied backgrounds and cultures of their students.

Study participants learned that engaging students where they are is key to creating an

environment of respect and learning. Instructor comments highlighting this included, "Being more sensitive to the fact that what I'm seeing may not be the whole picture," "I want to make everything more clear in the beginning of class, and discussions about being more respectful about other people's opinions," and "I want to help those [white] students while also making sure that people of color feel welcome to say things and say hey, this is my reality, even though it's not representative of everyone." A challenge all instructors faced is students do not all come to university with the same level of preparedness. Since "some have better skills than others" there are students who need more support. The appreciation for these varied perspectives led instructors to struggle both with how to incorporate these perspectives into the class and design times to meet with students to expand their understanding of student perspectives.

One instructor noted his struggle with understanding the perspective of students from other cultures and how to incorporate that perspective into the class. This instructor states:

It's still hard for me to figure out how a minority student might perceive the history that we're talking about. In particular, well, when we talk about the history of slavery, I would think that this is just a difficult subject to talk about and in my experience, most African American students kind of clam up more than usual when that topic comes up...Also, Native American students. You know, this is early American history, so we talk a good deal about English/Native or U.S./Native encounters, and so I really don't know how Native students perceive this and how it feels.

As instructors became more aware of the need for culturally responsive pedagogy, they simultaneously became aware of their lack of expertise and training in presenting multiple perspectives on issues. One instructor noted, "I have a gender class right now and I always feel like I am letting somebody down. Am I representing this position well enough? It does feel somewhat overwhelming."

In response to their new insights, our instructors adopted several teaching strategies to increase students' likelihood for success. For example, instructors attempted to select materials and represent diverse positions to increase the students' ability to relate and/or connect with the course. Selecting new culturally appropriate materials proved difficult, particularly as instructors had little training in culturally responsive pedagogy or culturally inclusive materials. One literature instructor noted:

I thought well, who am I to bring diversity into the classroom? There is so much to cover but, yeah, I was overwhelmed with what should I do…And then there are always new things out there so that's exciting but overwhelming.

In some cases, when appropriate texts were known and available, providing them was cost prohibitive for students. An introductory writing instructor stated, "Basic writing textbooks cannot be had for under $75. At-risk students are asked to pay $75 for a textbook…I think it's ridiculous, so I did away with the textbook and found stuff online that I thought would work." Although this strategy was helpful for the students, finding and selecting an entire semester's worth of materials proved an enormous time commitment for the instructor.

Another strategy adopted by several instructors to meet the needs of the students and increase the instructors understanding of the student perspective was to hold one-to-one meetings with students. Several instructors who incorporated individual meetings with students found them to be successful in building relationships with the students, but taxing on the instructor. One instructor noted, "Obviously I got to know them very well because I saw them in these tiny classes and then met them outside of classes like eight times, but that was too much. I need to change that a little bit." Instructors in both large and small classes were overwhelmed by the

amount of time it takes to engage the students they were concerned about and adapt the class to meet such varied student needs.

In addition to the time required outside of class, some instructors struggled with managing time inside the classroom. This time challenge is exacerbated with culturally responsive pedagogy because the interactive teaching required for a culturally responsive classroom can significantly increase the amount of time needed inside and outside of class beyond a traditional lecture based course delivery. The amount of time scheduled for a class is finite, and many of our instructors voiced concerns about scaling down their lecture time for more in-class writing and discussion. An instructor working with a large class stated, "The problem that I've had actually as long as I've done this assignment has been my own time management; making sure that they get a really solid chunk of discussion time in." While classroom discussion was viewed as a critical strategy for culturally responsive pedagogy, instructors reported struggling with more than just managing time when it came to classroom discussions and debate.

Classroom Discussion

Even when instructors felt they had been more successful in bringing diverse perspectives and materials to the students, they struggled with the ability to guide class discussions about culturally sensitive issues. When asked about the challenges faced in being more inclusive in the classroom, one instructor (a white woman who teaches African American literature) began by noting her own insecurities. She states:

> Do I have a right to talk about this? If I open up some time of dialogue am I going to be strong enough to control it, am I going to have enough empathy to handle the situation, you know compassion where necessary...I want to make sure a student doesn't feel shut down for the rest of the semester because of something that happened. Or something happens how can I make you feel comfortable again? How can I make each student feel safe to give his or her opinion?

While this instructor with an advanced degree in African American literature could be considered an expert in the subject area, an introduction to culturally responsive pedagogy increased her awareness of the variety of perspectives on any given topic and made her feel like a novice. Although it could be argued this increased appreciation for multiple perspectives makes this instructor a better and more culturally responsive teacher, it would be remiss to not also appreciate the increased stress and workload the instructor experiences as she attempts to present and balance the representation of multiple perspectives in the classroom.

Instructors reported that they were not alone in their reticence about classroom discussions on culturally sensitive issues; students also seemed to be reluctant to engage in discussions. When issues that involved race were part of the readings or the discussions, instructors were often met by silence. "I was unsuccessful in getting some of those quiet students to speak up." Others experienced direct resistance to the topics, "Eye-rolling, sitting there, who cares about this."

Instructors observed in some white students a feeling that since the subject was now about race they no longer had to participate. They became disengaged or turned to the students of color in the room and waited for them to answer. Instructors became frustrated with white students who did not appear to think issues of race were something they should be a part of; "You have students who are calling people "colored people" in the same class, so, on one hand, it's not their responsibility to educate anyone, but on the other hand, there's some people who

really need to be educated."

Instructors were aware many students of color did not participate in the discussions once the discussions turned to race because they did not want to be the "token:"

It's my impression that a lot of African American students….don't really want to engage these issues in the classroom and don't particularly feel comfortable talking about them and, no I'm not [asking them], "So, what is the black perspective on this?"

Instructors also discovered that when discussions did actively engage students in controversial issues, there was often such obvious disagreement from the white students and the students of color that instead of improving the classroom dynamics, the discussions increased the feeling of needing to tiptoe around issues. One person gave an example of a heated discussion by a white student and an African American student on the topic of "driving while black." The instructor was not certain how to handle the intense emotions arising out of the conversation so the fallback was to stop it:

…the African American student was very vocal and was great about giving opinions so it was a wonderful experience, but then there was another student who said something where he's like, "I don't believe this exists" and things like that, and I tried to jump in and steer it around but the damage had already been done.

Instructors reported they struggled to find, connect with and maintain a relationship with students, especially those students of color struggling in classes. One instructor noted, "For example, the student almost always arrives late." This instructor continued to talk about attempts with this one student, "We have met on many occasions and both he and I are honestly concerned about how well he's going to do in this class…I don't know what else to do." There was frustration at the inability to break up groups of students in the classroom; "even in my class, that is incredibly diverse, I see clumping; [they] just fight what I do…White students, they clump by geography," and "There are rural students and the urban students and they just gravitate toward each other. No matter what I do to get them together, they go back to the spots."

Assessment of Student Work

This increased appreciation of multiple perspectives also suggests an increased awareness about diversity in the manner in which students might demonstrate their learning. As instructors began to evaluate the outcomes of their pedagogical changes, it became clear they were forced to reevaluate their definitions of success and their assessment strategies. Based on literature reviewed in the initial workshop, some instructors made changes in their courses such as breaking projects into smaller pieces and building student reflection components into the course. Although these strategies were incorporated to increase student success and often did, some instructors were left wondering if such changes made their classes too "easy" and reflected a lowering of standards.

One instructor wrestled with this dilemma when asked about the success of the pedagogical changes:

It's a little bit hard to say only because this was such an outstanding group. I'm reluctant to put their success onto the changes that I made. I'm sure they had something to do with it, but it was one of the best…groups that I have ever had… In fact, I felt I need to grade harder. I think 22 out of 23 got a C+ or higher.

Although the fact that this number of students got a C+ or higher appeared to be a success, this instructor was clearly struggling with this outcome. Instead of praising the new pedagogical strategies and the increased learning of the students, the instructor wondered if he had high

enough grading standards:

> I've always felt like, jeez, if there aren't a substantial handful getting C's and D's, maybe the project's not hard enough. It is hard enough and I guess I just have to say this group was just so good that they all earned it. They did everything I asked them to do. I'm comfortable with their research, I'm comfortable with their writing ability, I'm comfortable with their thinking ability and the fact that the vast majority of them got a B or above is just due to them. It's not like I've got to go back and make the project harder, because it was a lot of work.

In this quotation one can witness the instructor wrestling with the old expectation that only some students should succeed and with a new understanding that, given the right coaching and environment, any student can succeed. An increased student success ratio does not necessarily mean standards have been lowered, but could also mean that new strategies raised students up to the level of previous standards.

The challenges the instructors faced led them to make changes in their assignments and assessments as well as in their attitudes towards working with students. There was a consistent feeling this did not require them to lower standards in any way; rather, they tried to negotiate other ways to approach the material for increased student success. Some of the changes were academic in nature and required the teacher to adjust reading assignments or pedagogical approaches to the material, "I would cut back on the amount of reading because it is not important that you read 4-6 essays…it is more important that you get it." Another instructor shared:

> One thing I learned is that they really suck at summarizing and paraphrasing because they are not careful readers and writers, So instead of having them read things that they are going to summarize and paraphrase a.k.a. copy and paste, we are going to watch them on TV or listen to them on tapes.

In sum, the Gateway Success Project's transition to a new way of teaching forced instructors to reframe their own teaching identities, change their teaching practices and challenge some of their assumptions about their role in the classroom. Instructors struggled with the alignment between their own behaviors, classroom modifications and their understandings of themselves as teachers. What had once been a position of expertise and authority is now a position of learning, questioning, and experimenting. While these instructors were eager to change their courses, embrace a new self-concept, and experiment with new strategies, they also experienced stress and uncertainty during the process. However, they also all expressed plans to use these strategies and other culturally responsive strategies in the future.

Learning Opportunities

In reflecting upon courses at the end of the semester, most of the instructors felt they had progressed in making their classes more inclusive, but had not yet perfected their classes. Instead of reporting upon this as problem, instructors viewed these challenges as learning opportunities. One instructor stated, "I had to tweak some things for spring semester just in terms of clarifying some stuff, questions that came up."

Instructors in our study embraced the learning paradigm (Barr & Tagg, 1995) for themselves and their students. In their provocative essay proposing a new paradigm for higher education, Barr and Tagg (1995) note the role of instructors will undergo a fundamental change when challenged with integrating culturally responsive pedagogy into their classroom. Instructors must transition from the role of "expert" teachers who impart knowledge to the role

of "coaches" who create and moderate learning environments in which teacher and student exchange the role of expert and novice. If instructors were supposed to be experts in teaching as well as in their content material (Barr & Tagg, 1995), they would be discouraged by their experiences with culturally responsive pedagogy. However, the reverse was often true. By positioning themselves as co-partners with students in this process of learning, instructors normalized challenges and failures as part of the learning process and were excited about the small successes experienced along the way. One instructor explained:

> It will be fascinating to see how we all came into it and looking back at how naïve we were. But that is part of our process. That whole process of learning, that stage is a part of it…that scary stage like am I ever going to get this? The ones who have been teaching it longer seem more relaxed with it so that gives me hope.

This instructor's hope seems to come from two sources – the embracing of the process model of learning and the experiences of other colleagues.

As suggested by previous research (Glowacki-Dudka et al., 2012), the faculty learning community was very helpful for these instructors. In this study, all of the instructors were able to connect in a large group setting during the initial training session and again during the focus groups. In addition, the instructors were also able to connect with the researchers throughout the time period of the project. This social support served three primary purposes: normalizing of experiences, provision of resources, and accountability for reflection.

When instructors met with one another in the group setting, they were able to share their experiences in the classroom. Because instructors traditionally work alone, the life of a teacher can be very isolating. One instructor reflected, "I always think about teaching as being very solitary. So well I mean that's just how it's always been. You know, I was given textbooks and was told 'here, get out there.' " Participating in the learning community allowed members to break out of that isolation and share their experiences with one another. The net result of this sharing was instructors realized the challenges they were experiencing were also being experienced across the university. During the focus group, one instructor explained her thoughts, "Are my students reacting this way because I'm the only person asking them to make connections in this way? So, they think that I'm just like a space alien and not someone who's challenging them to think?" By attending these workshops, the instructor was able to normalize her experiences and build connection with other instructors.

Reflecting on the focus group, another instructor stated:

> One of the things I enjoyed or took out of it most is seeing how many other faculty members were interested in the same issue. So I think knowing that there's that support there and that there are other people who share the same interests and goals was important.

These connections also served as a source of resources and ideas for teaching. One instructor explained, "I would love to get together again as a group. I wish more people could have come to the small group thing because I want to know more about what other people are doing." During the workshop, focus group, and interviews, instructors were able to share ideas and resources. For example, when one instructor would wonder what to assign for a reading, another instructor would suggest a possible choice. Assignment struggles could be detailed and possible alternatives brainstormed.

Finally, the interviews and interactions with others in the learning community encouraged instructors to reflect upon the changes in their classrooms and what they were learning. Although all of the instructors believed reflection is an important part of learning (Schon, 1983) and many

assigned reflection activities to their students, actually taking time to reflect upon their own learning is always a challenge. Hence, one of the important functions of a learning community is to hold one another accountable for being reflective practitioners. One participant noted:

> At a bare minimum, forcing me to sit down and reflect on the questions helped me to see the forest (vs. the trees). The interviews (and accompanying questions) allowed me to pause and consider the impact of the changes I was making beyond just logistics. Perhaps more importantly, I made changes to the assignments in response to my reflections. For example, after reflecting that students probably weren't getting enough time to do some of the mini-writings, I started moving them to the middle of the lecture instead of the end. I also changed the instructions and structure of some of the mini-writings as a result of the reflective process. I suppose it might also be worth saying that I found the interviews and reflections to be support-building. It reminded me that I was part of a bigger team of instructors making these changes and that others thought the work I was doing was important. This was particularly helpful in the middle of the semester as I found myself overwhelmed with classes and other projects.

Some of the beneficial aspects of this learning community have also been reported in studies of other institutions. A survey of people at 132 institutions on the impact of faculty learning communities on incorporating diversity into teaching found that participants gained an understanding of student learning differences, and learned how to consider the variety of needs of their students when planning and implementing courses (Petrone, 2004). Researchers at Miami University observed that "an FLC on diversity must operate on both emotional and intellectual levels" (p. 116), but no mention is made of whether the community continued meeting through the implementation phase, when our study's participants especially appreciated peer feedback and support.

Conclusions

Research has found that beyond disseminating knowledge of a new teaching method, the following three strategies have been important in achieving effective use of the method: focusing on it over a period of time (a month, semester or year) rather than in a one-day workshop; providing performance evaluation, feedback or coaching to the instructors while they are trying the new method; and focusing on changing faculty conceptions of their students and themselves (Henderson, Beach & Finkelstein, 2011). The Gateway Success Faculty Development Process met these criteria and resulted in several indicators of success, while a similar project at a different institution with the same goal of promoting inclusive pedagogy had a smaller fraction of participants who actually attempted new pedagogical strategies. Analysis of this comparison project hypothesized that periodic opportunities for group discussion and reflection on the process would have resulted in continued improvements in teaching (Glowacki-Dudka et al., 2012).

This study explored the experiences of instructors changing their courses to create a more culturally responsive classroom. While the transformation process was a very challenging one for instructors, several enabling factors, many supported by previous research, encouraged success and a continuing commitment to transformation. Our study supports the idea that the implementation of learner-centered, culturally responsive pedagogies benefits from ongoing social support and time for instructor reflection as instructors deal with numerous potential challenges to transforming their teaching. These challenges might emerge from: 1) time constraints; 2) lack of confidence in trying new methods; 3) confronting their own cultural

insensitivity; and 4) dealing with the resulting emotions. All study participants encountered such difficulties but nonetheless expressed plans to use learner-centered methods and culturally responsive strategies in the future.

These findings suggest that higher education institutions looking to create more inclusive environments might consider the use of learning communities, which can provide instructors with a forum to discuss their experiences, help to normalize the challenges they encounter, and offer support for small victories on the path towards transformation of their pedagogy. Future research should continue to explore the links between faculty learning communities and successful teacher development. In addition, institutions could use this study to give new instructors, and instructors trying new teaching methods, a more realistic preview of the current higher education environment. If instructors understand that challenges like those encountered by our Gateway Success participants are a normal part of their job, and they embrace failure and partial success as necessary to teacher development, it may help to decrease teacher burnout and turnover (Miller, 2012) and simultaneously increase student success.

References

Adams, M. (1992). *Promoting diversity in college classrooms: Innovative responses for the curriculum, faculty, and institutions.* San Francisco: Jossey-Bass.

Amundsen, C., & Wilson, M. (2012). Are we asking the right questions? A conceptual review of the educational development literature in higher education. *Review of Educational Research, 82*(1), 90-126. dio: 10.3102/0034654312438409

Barr, R.B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change, 27*(6), 12-26. doi: 10.1080/00091383.1995.10544672

Cooper, M. A. (2010). Investing in education and equity: Our nation's best future. *Diversity and Democracy, 13*(3), 1-4.

Demir, K., Sutton-Brown, C., & Czerniak, C. (2012). Constraints to changing pedagogical practices in higher education: An example from Japanese lesson study. *International Journal of Science Education, 34*(11), 1709-1739. doi: 10.1080/09500693.2011.645514

Gay, G. (2000). *Culturally responsive teaching: Theory, research, and practice.* New York: Teachers College Press.

Glowacki-Dudka, M., Murray, J. & Concepcion, D.W. (2012). Reflections on a teaching commons regarding diversity and inclusive pedagogy. *International Journal for the Scholarship of Teaching and Learning, 6,* 1-13.

Henderson, C., Beach, A. & Finkelstein, N. (2011). Facilitating change in undergraduate STEM instructional practices: An analytic review of the literature. *Journal of Research in Science Teaching, 48*(8), 952-984. doi: 10.1002/tea.20439

Henderson, C., Dancy, M., & Niewiadomska-Bugaj, M. (2012). Use of research-based instructional strategies in introductory physics: Where do faculty leave the innovation-decision

Considine, J.R., Mihalick, J.E., Mogi-Hein, Y.R., Penick-Parks, M.P., & Van Auken, P.M.

process? *Physical Review Special Topics - Physics Educational Research, 8,* 020104. doi: 10.1103/PhysRevSTPER.8.020104

Knobloch, N.A., & Ball, A.L. (2006, April). *Analyzing the contextual, motivational, and conceptual characteristics of teaching faculty in regard to the use of learner centered approaches to teaching.* Paper presented at the meeting of the American Education Research Association, San Francisco, CA.

Ladson-Billings, G. (1999). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465-491. doi: 10.3102/00028312032003465

Miller, K. I. (2012). *Organizational communication: Approaches and processes.* Boston, MA: Wadsworth.

Nelson, C. E. (1996). Student diversity requires different approaches to college teaching, even in math and science. *American Behavioral Scientist, 40(*2), 165-175. doi: 10.1177/0002764296040002007

Petrone, M. C. (2004). Supporting diversity with faculty learning communities: Teaching and learning across boundaries. *New Directions for Teaching & Learning, 97,* 111-125. doi: 10.1002/tl.138

Richards, H., Brown, A., & Forde, T. (2007). Addressing diversity in schools: Culturally responsive pedagogy. *TEACHING Exceptional Children, 39(*3), 64-68.

Schon, D. A. (1983). *The reflective practitioner: How professionals think in action.* Farnham, Surrey England: Ashgate Publishing Limited.

Sleeter, C. (2012). Confronting the marginalization of culturally responsive pedagogy. *Urban Education, 43*(2), 562-584. doi: 10.1177/0042085911431472

Smith, T. R., McGowan, J., Allen, A. R., Johnson, W. D., II, Dickson, L. A., Jr., Najee-ullah, M. A., & Peters, M. (2008). Evaluating the impact of a faculty learning community on STEM teaching and learning. *The Journal of Negro Education, 77*(3), 203-226.

Steele, C. (2010). *Whistling Vivaldi: How stereotypes affect us and what we can do.* New York: W.W. Norton & Company.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park, CA: Sage Publications, Inc.

Surveying New Testament survey: The impact of demographics and modality on an introductory New Testament class

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Abstract: Both adult and traditional students at Indiana Wesleyan University take an introductory New Testament course in conventional, compressed, and accelerated formats and through online and onsite settings. This wide variety of demographics and modalities raises the issues of if and how the various incarnations of this course facilitate the achievement of course and institutional learning outcomes. This investigation surveys the pre-test, post-test, and final paper scores of students in varying sections of the class. An interpretation of the findings concludes that the course positively impacts the learning of all types of students. However, it also suggests that traditional students who are more familiar with the Bible may be better served by what are typically deemed andragogical approaches while adult students who are less familiar with the Bible may be better served by incorporating what are often deemed pedagogical approaches.

Keywords: online, onsite, traditional, adult, accelerated, compressed, andragogy, pedagogy, general education, outcomes

Background and Purpose

Almost all colleges and universities have some type of core curriculum or general education courses that aim to develop students with well-rounded skills and perspectives. Many Christian or church-related colleges and universities require courses in Bible or theology as part of this curriculum with a variety of goals for students, including liberal learning, critical thinking, and spiritual transformation (Holland & Webster, 2012; Walvoord, 2008; Holtz, 2003). However, this presents a special challenge when a university engages a wide variety of students with various teaching modalities. Various theorists and researchers claim that adults learn differently than children/young adults (Knowles, 1998; Merriam & Caffarella, 1999), that different delivery modes call for different instructional techniques (Garrison, 2011; Delmarter, Gravett, Ulrich, Nysse, & Polaski, 2011), and that different course durations require different pedagogical tools (Wlodkowski & Ginsberg, 2010). Can a single set of course outcomes be appropriate and appropriately delivered to students from a wide demographic spectrum in so many different ways?

Indiana Wesleyan University (IWU) seeks to do just this. IWU is a large, Midwestern, Master's level university. It has approximately 3,000 traditional students on a campus located in Marion, IN and approximately 12,000 adult students enrolled in a variety of professional programs taking courses both online and onsite at several educational centers located in Indiana, Ohio, and Kentucky. IWU is one of the many faith-based institutions that has actively developed adult education (Wlodkowski, 2003, p. 6). As a faith-based liberal arts university, one of IWU's

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institutional learning outcomes is that all undergraduate students will be able to "explain ethical, Christ-like attitudes, values, and worldview" and apply those same attitudes, values, and worldview in their careers and communities. Of course, this outcome is met through a variety of means, but all undergraduate students at IWU, whether traditional students on the liberal arts campus or adult students in professional programs, take BIL 102: New Testament Survey as one of the key instruments for meeting this ambitious goal of Christian formation.

Adult and traditional students at IWU are expected to differ in age and work experience (though there are exceptions), but other differences emerge as well. The traditional campus has recently increased its small diverse student population, but the adult programs have had a robust presence of diverse students for several years. Most students attending the traditional campus choose IWU because it is a Christian university and come with significant Christian background. The faith background of adult students varies widely from long-term active church members to those with little exposure to Christianity. Most 3 credit courses on the traditional campus are taught in conventional 15 week semesters with approximately 135 instructional hours, but a handful of courses (including BIL 102) are offered online over the summer in a compressed format with 135 instructional hours condensed into a 4-5 week period. The adult courses are in an accelerated format with approximately 70 instructional hours over a 5 or 6 week period.

Over the past few years, the author of this study has taught each of the varieties of New Testament Survey: accelerated adult online, accelerated adult onsite, conventional traditional onsite, and compressed traditional online. The recent creation of traditional online courses and a redesign of the adult courses generated reflection about the use of course outcomes, materials, and activities across the different modalities and the different students who take this course. This experience prompted questions about student performance in the course and its connection to the institution's larger goals of formation in "ethical, Christ-like" perspectives. This generated a primary and complex research question: How do student demographics and course delivery modality interact and impact student achievement in an introductory New Testament class? This is followed by a second related question: Can a broad institutional outcome be met equivalently by one class taught to a wide variety of students through different modalities? Thus, the purpose of this study is to examine the impact of course modality and student demographics on the effectiveness of BIL 102: New Testament Survey, or, to take a survey of the results of New Testament Survey.

Literature Review

This study intersects several dimensions of research but is largely framed within the scholarship of teaching and learning (SoTL), because it seeks to rigorously examine the practice of teaching and the results of learning with a view to improving both (Gurung & Schwartz, 2009). It joins many others in comparing the effectiveness of online and onsite (or face-to-face) courses. A recent government report offered a meta-analysis of several studies, concluding that instruction offered online is as effective as traditional classroom instruction (U.S. Department of Education, 2010, p. 39). However, questions still exist about the validity and conclusiveness of such studies (Mersotis & Phipps, 1999), about the effect of extraneous factors (Driscol, Jicha, Hunt, Tichavsky, & Thompson, 2012), about traditional students adjusting to online courses (Galyon, 2012), and about the dynamics of teaching biblical studies online (Delmarter, Gravett, Ulrich, Nysse, & Polaski, 2011). Online courses cannot merely replicate the techniques of onsite learning, because each modality has its own strengths and weakness when contributing to student

learning outcomes (Sussman & Dutter, 2010). While a general consensus has emerged, supported by a variety of empirical studies, that online education can be as effective as traditional onsite education, much of this research has focused on courses in professional programs like business, education, technology, and nursing (U.S. Department of Education, 2010, pp. 21-26). Further research on courses in the humanities (such as biblical studies) could confirm the effectiveness of online courses and further our understanding of how to optimize both onsite and online modalities.

Next, this study also builds upon a long line of research on the differences between educating youth and educating adults, or, the differences between pedagogy and andragogy. More attention has been paid in educational research to the teaching of traditional undergraduates than to teaching adults (Jarvis, 2004; and see the extensive discussion of traditional undergraduate development in Holland & Webster, 2012). The classic resources on andragogy come from the work of Knowles (Knowles, 1970; Knowles, 1998; Knowles, Holton, & Swanson, 1998). Knowles and others (Merriam & Caffarella, 1999; Cranton, 1992; Mezirow, 1991) have argued for fundamental differences between learning in pedagogy and andragogy such as: adult learners who are self-directed vs. young learners who are dependent on the instructor, adult learners who bring a wealth of experience to connect to their learning vs. young learners who have limited life experience, and adult learners who seek application to real-life tasks vs. young learners who seek to acquire information on a subject matter. Despite the widespread acceptance and influence of this perspective, Knowles's work has been challenged from a variety of perspectives (Jarvis, 2004, pp. 121-25). For example, Jarvis (1993; 2004, pp. 251-52) argues that relevant student experience with the subject matter is the key factor that should differentiate andragogical from pedagogical approaches (not chronological age). Others have suggested that the pedagogy vs. andragogy dichotomy is misguided and stereotypical since either approach may be appropriate given the needs of the students whether they are younger or older (Holmes & Abington-Cooper, 2000; Davenport, 1987). The use of BIL 102: New Testament Survey for both traditional students typically aged 18-19 who are often early in their college career and adult students who are older and have a wider set of experiences means that one must assess the value of the andragogy/pedagogy divide and implement appropriate approaches thoughtfully in the various incarnations of this course. Thus, this study will also analyze the performance of traditional and adult students to try to discern what approaches will best serve the wide variety of students who take this course.

Finally, this study encounters the issue of time in intensive, compressed, and accelerated courses. For the sake of clarity, this investigation will refer to a shortened section (4-5 weeks) with the traditional number of instructional hours (135) as a *compressed* section. This is the case for the online version of BIL 102 for traditional students. All of the adult courses at IWU are *accelerated*, meaning that they both contain fewer instructional hours (approximately 70) over a shorter duration (5 or 6 weeks) because of the andragogical principle that adults have the ability to learn more quickly and effectively. Both faculty and students have mixed perceptions of compressed courses, questioning whether they allow time for reflection and rigor (Lutes & Davies, 2013, pp. 21-22). Workload and compressed time for assessment tasks are primary concerns in accelerated courses (Lee & Horsfall, 2010). This is despite the fact that several studies have asserted the equal effectiveness of compressed and conventional courses in achieving learning outcomes. (Vreven & McFadden, 2007; Austin & Gustafson, 2006; Swenson, 2003). Similarly, recent studies suggest indistinguishable levels of learning between adults in accelerated formats and younger students in conventional formats (Wlodkowski, 2003).

However, once again, the differing formats call for strategic shaping of the learning environment and instructional techniques (Wlodkowski & Ginsberg, 2010). Thus, this study will compare the performance of students in conventional, compressed, and accelerated versions of BIL 102 to discern the dynamics at work in each.

Participants and Method

This study collected data on various incarnations of BIL 102: New Testament Survey taught at Indiana Wesleyan University during the academic year of 2013-2014. After obtaining Institutional Review Board approval, the author of this study taught various sections of this course. The sample included 2 sections of adult students in an accelerated online format (total of 22 students), 2 sections of adult students in an accelerated onsite format (total of 31 students) 2 sections of traditional undergraduates in a compressed online format (total of 24 students), and 1 section of traditional students in a semester long onsite format (total of 29 students). This is a total of 106 students. Recall that accelerated adult courses included approximately 70 hours of work in a 5 week period. The compressed online format for traditional students included approximately 135 hours of work in a 4-5 week period, and the onsite format for traditional students included approximately 135 hours of work in a 14 week semester. A set of assessments was shared across the courses (unit quizzes, interpretation journals, and a final paper) with some assessments targeted at the specific formats following best practices (discussion boards, group presentations, reading reports, etc.). The author created all of the course materials and facilitated each section. Since research has shown that instructor effectiveness and quality has a noticeable impact on student achievement (Frick, Chadha, Watson, & Zlatkovska, 2010; Rockoff, 2004), this diminished the effect of instructor variation and allowed more focus on the role of demographics and modality. The students were informed that they would be participating anonymously in a project to improve the delivery of introductory Bible courses through an analysis of their pre-test and post-scores as well as their final paper.

Data on the performance of the various groups were gathered from three primary sources: the pre-test, the post-test, and the final course paper. To this, one may add the key measurement of the difference between the pre-test and the post-test. The pre-test/post-test was administered through the web service Qualtrics. The test opened with a set of demographic questions that identified students as adult or traditional, what modality they were employing (online or onsite), and if they felt they were familiar or unfamiliar with the New Testament. The test itself was broken down in to questions about the historical-cultural background of the New Testaments (10 questions out of 40), questions about the contents of the New Testament (18 questions out of 40), and questions about theological perspectives in the New Testament (12 questions out of 40).[2] The number of questions in each category roughly represents the amount of time given to that domain in the course. Also, this pre-test/post-test did not include material covered during the additional time allowed in the non-accelerated courses (e.g. some Pauline letters and most of the General Epistles in the New Testament). The following is a sample of the questions from the pre-test/post-test:

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[2] The pre-test/post-test ended with 2 open ended questions about perspectives on salvation in the New Testament and the steps of interpretation, but many students either answered these questions very briefly or omitted them altogether. If this test is used again in the future, it may be best to place these questions at the beginning to discourage students from skipping over them.

1. What is the term used to identify the final week of Jesus' life including his teaching, crucifixion, and resurrection?
    a. The passion
    b. The travel narrative
    c. The Jerusalem chronicle
    d. The last temptation
2. Which of these pairs of letters deals extensively with issues surrounding the return of Jesus?
    a. 1 & 2 Corinthians
    b. 1 & 2 Thessalonians
    c. 1 & 2 Timothy
    d. None of the other answers
3. The culture of surrounding the NT placed the highest public importance on a person's
    a. Self-esteem
    b. Wealth
    c. Honor
    d. None of the other answers

Each section had a nearly identical final paper with the traditional students writing a slightly longer paper to accommodate the number of hours required for a traditional credit hour load. The paper addresses higher level learning outcomes such as synthesis and application. All sections of the course focused on 5 blocks of the New Testament (Mark/Matthew, Luke-Acts, John, Paul, and Revelation). In the final paper, students had to describe three of these blocks, synthesize the perspectives on salvation found in those three blocks, and then apply that synthesis to a contemporary situation or issue. Students were told to include at least 7 passages of scripture and citations of various materials from the course including lectures and textbook readings. The final papers were graded by the author according to a single 100 point rubric with the following categories: use of course resources, description of three New Testament perspectives on salvation, the synthesis of those three perspectives, application of that synthesis, and writing/formatting.

Findings

The following analysis considers 79 paired pre-tests and post-tests and 84 final papers. Out of the 106 students, 4 pre-test/post-test scores are not considered because those students received an "F" as a final grade. 15 Students did not complete the post-test, and the scores of 8 students on the pre-test/post-test were omitted because they took less than 5 minutes to complete the 40 question test. This brings the number from 106 to 79. With regard to the papers, the 4 students with an "F" were removed from the sample as well as 4 students who did not turn in the final paper. Other paper scores were removed as well: 2 students plagiarized on the final paper, 4 students did not turn in the final paper, and 8 received an "F" on the final paper (while still managing to pass). This brings the number down from106 to 84. The following analysis breaks down the scores in various ways. First, one can divide the results into students in online sections and students in onsite sections to examine the impact of modality. Second, one can divide the results into adult students and traditional students to examine the impact of demography. Third, on the pre-test students rated themselves as either being "familiar" or "unfamiliar" with the

contents of the New Testament in order to measure how background impacted student performance. Finally, the results will be broken down according to the four groups of students/sections: adults in online sections, adults in onsite sections, traditional students in online sections, and traditional students in onsite sections. This will provide a sense of how results in the four different formats of the course compare to each other.

The Distribution of the Data

This study examines very different settings of BIL 102 across a wide range of students. The distribution of the data in some of these cases reveals interesting dynamics and challenges for evaluating the results and their implications for teaching this course best to this variety of students. When taken as a whole, the performance of all of the students distributes approximately normally in each of the primary measurements: the pre-test, the post-test, the pre-test to post-test difference, and the final paper total. However, when broken down into the various groups (adult online, adult onsite, traditional online, and traditional onsite) variations from approximately normal distribution begin to appear.

The pre-test scores ranged from 6 to 30 (out of 40) with a mean of 15.66. These results fit with the author's expectations of student's performance on the pre-test. The Shapiro-Wilk result is .117 for the pre-test scores, indicating approximately normal distribution as displayed in Figure 1.

The post-test score ranged from 12 to 39 (out of 40) with a mean of 22.63. The test demonstrated reasonable validity and reliability. 33 of the 40 questions were answered correctly by a majority of the students on the post-test. Of the 7 questions not answered correctly by the majority, every question received at least 16 correct responses and some as many as 42 correct responses. The Shapiro-Wilk result is .359 for the post-test scores, indicating approximately normal distribution as shown in Figure 2.
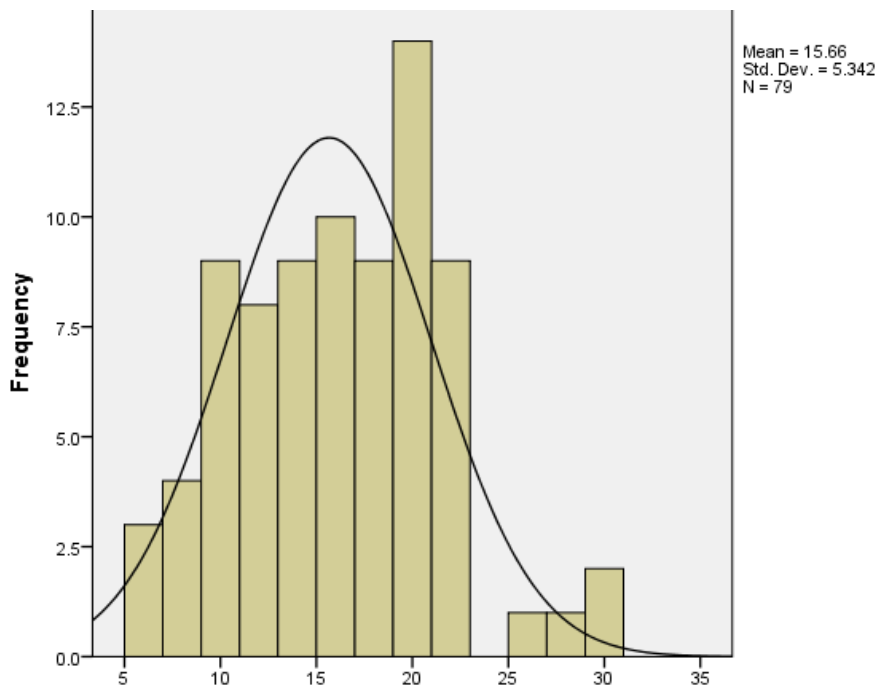
Figure 1. Pre-test scores for New Testament Survey
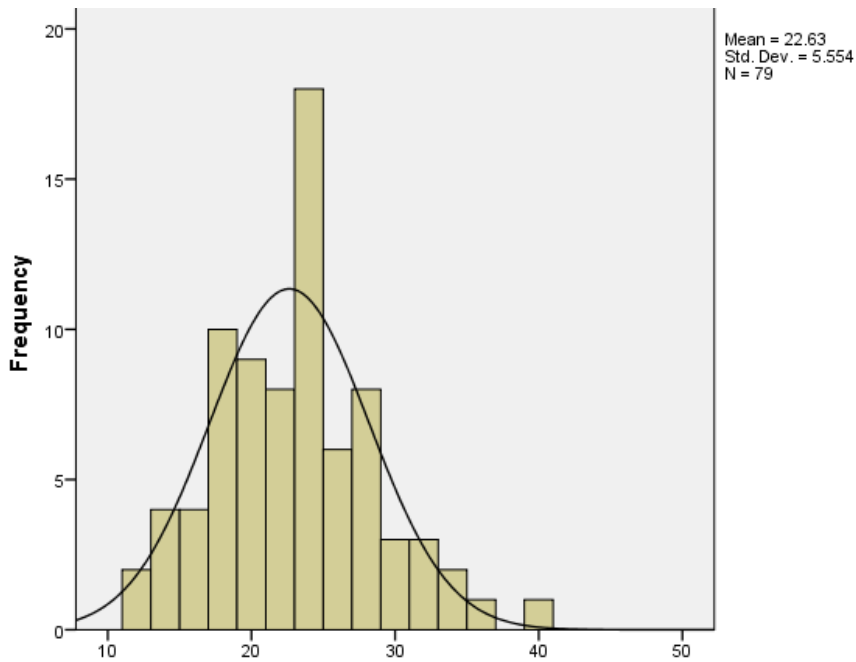
Figure 2. Post-test scores for New Testament Survey

The pre-test to post-test difference ranged from -2 to 17, which is rather large. The mean was 6.97, which is approximately 17% of the 40 available points. However, this mean also had a rather large standard deviation of 4.394. The Shapiro-Wilk test gives a result of .099 which supports an approximately normal distribution of the differences as seen in Figure 3.
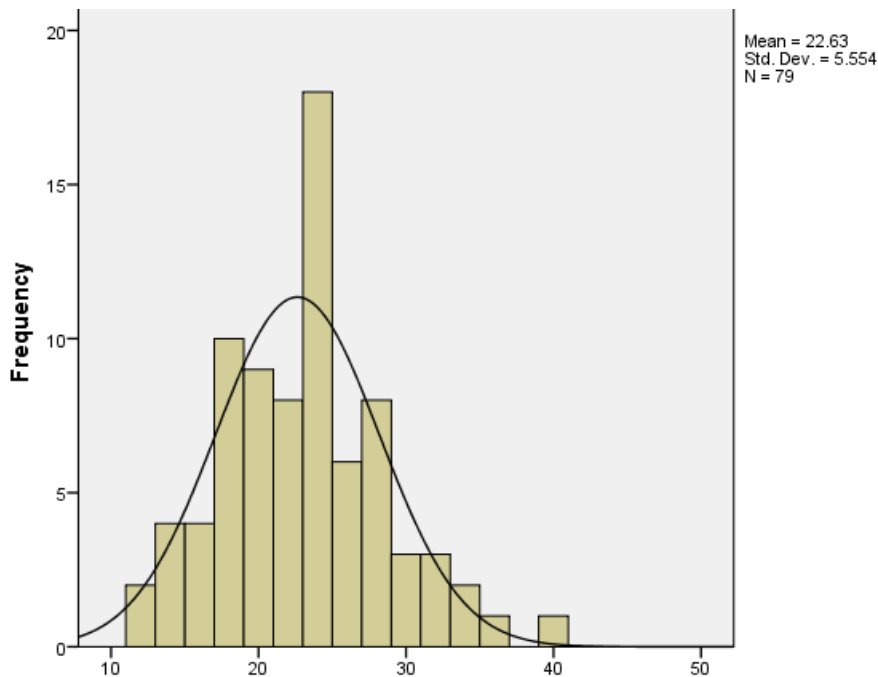
Figure 3. Pre-test to post-Test differences

The total paper score appears to be the most normally distributed of all of the data. (Note that $n = 84$ here since some students did not complete the post-test adequately). With 100 points available on the final paper, the mean is 80.71 with a standard deviation of 9.971. This means that about 68% of the scores land between 70 and 90 or that a majority of the scores ranged from a C- to a B+. Figure 4 reflects a very balanced distribution of the total paper scores.
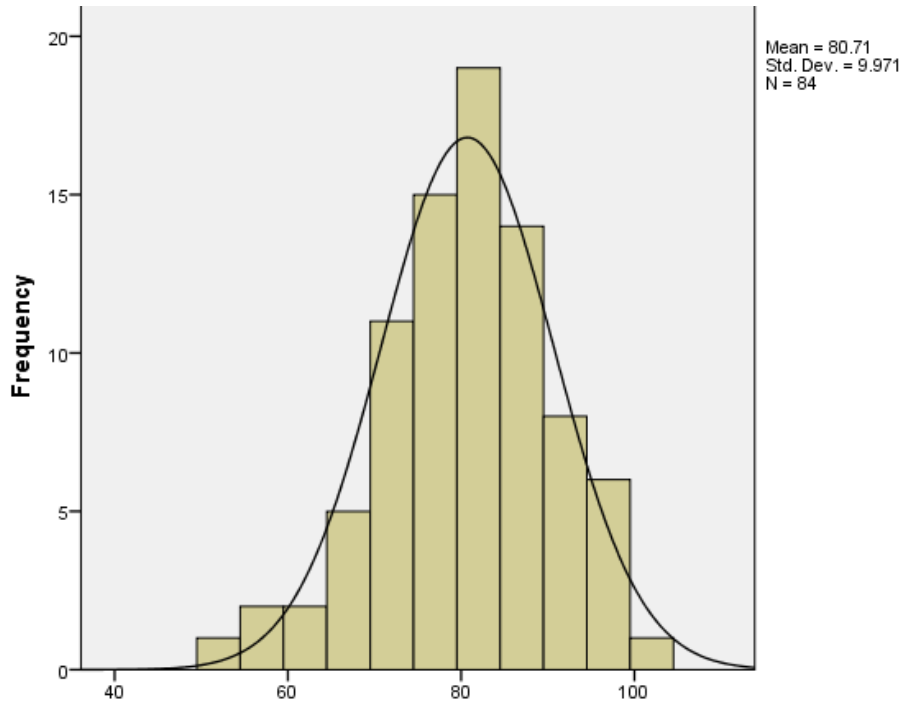
Figure 4. Total score on final paper.

However, when one breaks the data into the four separate groups (adult online, adult onsite, traditional online, and traditional onsite) some results do not distribute normally. Table 1 provides information for each of the four group's scores on the pre-test.

Table 1

Four groups performance on the pre-test

Group	Number	Mean	Std. Dev.	Range	Shaprio-Wilk
Adult online	18	13.11	4.391	6 to 22	.438
Adult onsite	21	14.29	5.737	6 to 22	.014
Traditional online	21	16.67	4.608	9 to 27	.653
Traditional onsite	19	18.47	5.200	11 to 30	.070

Note that the Shapiro-Wilk result for the adult onsite group is .014 indicating a non-normal distribution (all other group's scores indicate approximately normal distribution with $p > .05$). Figure 5 reveals a bi-modal distribution of the data for the adult onsite scores on the pre-test.
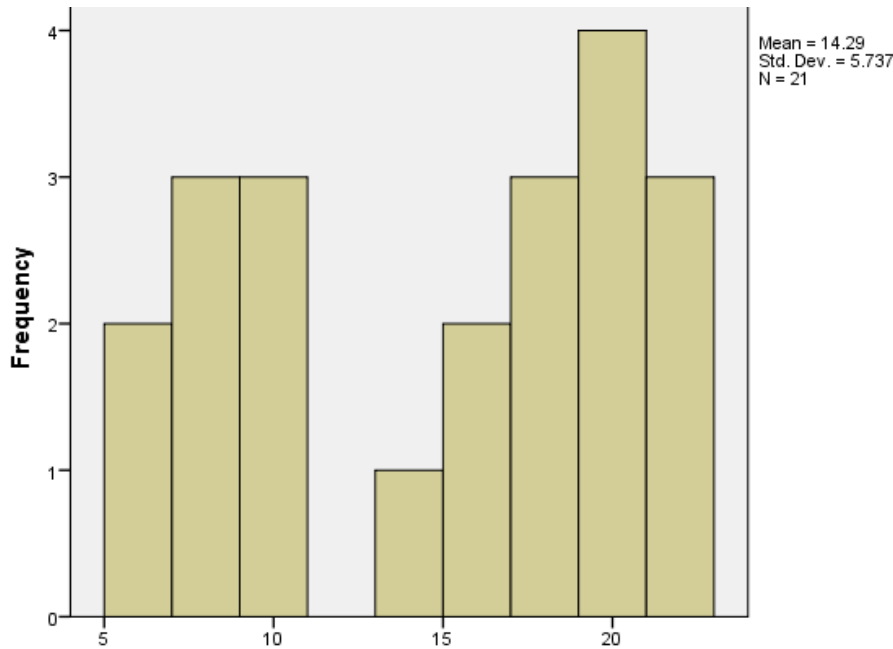
Figure 5. Adult online pre-test scores

The two peaks reflect the author's experience teaching New Testament Survey to adult students in onsite sections. Many of these sections have two discernible groups of students: those with a long and rich Christian upbringing who are still very active in their churches and thus more familiar with the Bible and those with very little exposure to Christianity and very little familiarity with the Bible. This chart shows peaks at those very different levels as reflected in the pre-test with a few scattered in the middle. This will call for some nonparametric evaluation to compare the scores of the four groups on the pre-test.

A similar phenomenon occurs when examining the post-test scores of students in the four groups.

Table 2

Four groups post-test scores

Group	Number	Mean	Standard Dev.	Range	Shaprio-Wilk
Adult online	18	20.00	4.971	12 to 30	.663
Adult onsite	21	20.86	5.199	12 to 30	.533
Traditional online	21	24.19	4.926	18 to 34	.169
Traditional onsite	19	25.37	5.659	15 to 39	.034

Again, the scores in one of the four groups are not normally distributed, but this time it is the traditional onsite students ($p = .034$). Figure 6 reveals an extreme data point at the very top and bottom of the range with a very high peak in the lower-middle and a stretch of higher scores with no corresponding batch of lower scores.
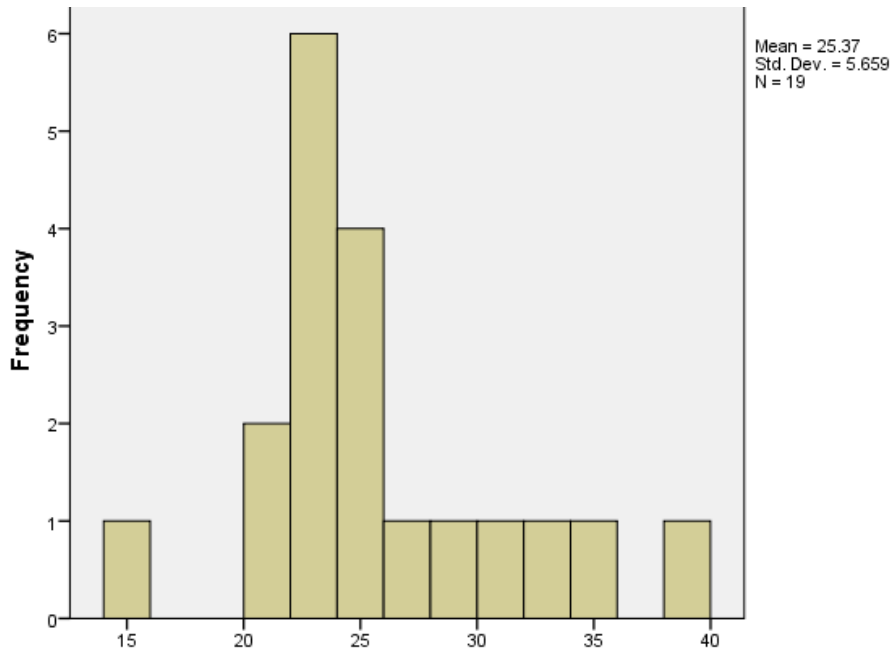
Figure 6. Traditional onsite post-test scores

This again calls for nonparametric testing when comparing the scores of the four groups on the post-test.

Table 3 provides information on the difference in scores between the pre-test and the post-test.

Table 3

Four groups pre-test to post-test difference

Groups	Mean	Standard Dev.	Range	Shaprio-Wilk
Adult online	6.89	4.337	2 to 16	.015
Adult onsite	6.57	4.823	-1 to 17	.054
Traditional online	7.52	4.523	-1 to 17	.825
Traditional onsite	6.89	4.095	-2 to 14	.833

First, it is striking that the means and standard deviations are so close across all four groups. This will be explored further below. Second, these data reveal that in three of the four groups at least one student scored worse on the post-test than on the pre-test (thus the negative score difference). Furthermore, the scores of 5 students were omitted from this data set because the web-based testing report showed that these students took less than 5 minutes to complete the 40 question post-test. Students were given credit for completing the post-test, were told not to study for it because it would not be graded, and apparently some took it with disregard, merely trying to complete the task as quickly as possible to gain the allotted points at the end of the course. Third, one of the four groups falls outside of normal distribution again as indicated by the Shaprio-Wilk score, but this time it is the adult online group ($p = .015$). Figure 7 displays an unusual distribution of differences between the pre-test and post-test among these students.
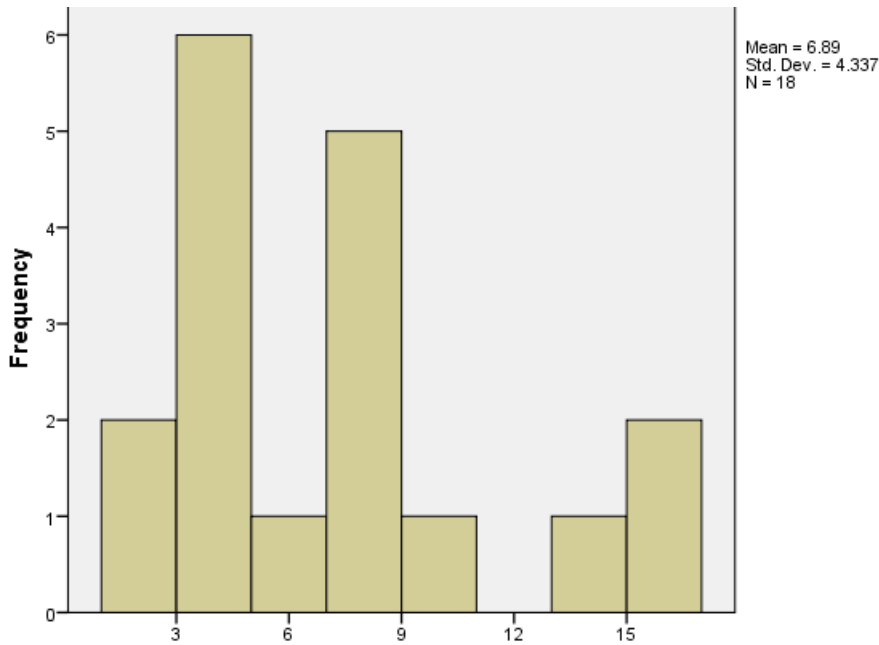
Figure 7. Adult online pre-test to post-test difference

As indicated by the students who took less than 5 minutes to complete the post-test, some of the students may have taken the post-test (or the pre-test) quickly and carelessly, seeking only to obtain the points allotted for completing it. This calls for the use of nonparametric tests when evaluating the pre-test to post-test difference among the four groups.

The data for the total paper scores are provided in Table 4.

Table 4

Four groups total paper scores

Group	Mean	Standard Dev.	Range	Shapiro-Wilk
Adult online	79.00	10.061	52 to 92	.098
Adult onsite	79.50	10.714	56 to 98	.655
Traditional online	81.50	7.990	63 to 94	.850
Traditional onsite	83.45	10.928	58 to 100	.800

The total score on the final paper is normally distributed for each group (Shapiro-Wilk score in all cases $p > .05$). One interesting feature here is that the standard deviation for the traditional online group is over 2 points lower than all the others, indicating a more compressed set of scores around the mean. The traditional online group has the highest low score and the second lowest high scores. Thus, this group had less spread and range than any of the others. Regular parametric tests can be employed when exploring the scores of the four groups on the final paper.

Pre-test Scores

The pre-test scores will first be considered according to the three sets of pairs: online and onsite students, adult and traditional students, and students who are familiar and unfamiliar with the Bible. Table 5 provides the number, mean score, and standard deviation of the scores as well as the results of the T-test for significance and the partial eta squared score for effect size.

Table 5

Paired groups pre-test scores

Group	Number	Mean	Standard Deviation	T-test	Partial Eta Squared
Online	39	15.03	4.799	.302	.014
Onsite	40	16.28	5.818		
Adult	38	13.71	5.193	.001	.125
Traditional	41	17.46	4.874		
Familiar	38	17.68	5.914	.001	.135
Unfamiliar	41	13.78	4.814		

The online and onsite student scores on the pre-test show no statistically significant difference (p = .302). This category cuts across both adult and traditional students focusing only on the modality of the course. The two mean scores were rather close at 15.03 and 16.28. The partial eta squared score was .014 representing a negligible effect size based on this grouping. However, separating the students into the demographic groups of adult and traditional results in strong show of statistical significance (p = .001). The adult student mean score was 13.71, and the traditional student mean score was 17.46, yet the effect size was only .125 which is still rather small. This may indicate that adult students tend to come into the course with a lesser degree of knowledge about the New Testament than their traditional counterparts. Other explanations are possible as well: perhaps these adult students were simply trying to complete the pre-test for the completion points, perhaps lower familiarity led to lower effort, or perhaps the adult students were poorer test takers. Very similar (and very predictable) results obtain with the familiar and unfamiliar groups. With a p value of .001 again, one can be very certain of a significant difference with the familiar student scoring almost 4 points higher on the pre-test. Students as a whole seem to have assessed their entry level knowledge of the New Testament with some degree of accuracy. However, again the effect size is on the small end of the scale at only .135. Additionally, there is a significant negative correlation between the adult-traditional and familiar-unfamiliar groupings. A Spearman's rho test shows a high degree of significance and a moderate effect size here (r_s = -.571, p < .000). Thus, adult students are moderately likely to be unfamiliar with the Bible (29 out of 38) while traditional students are moderately likely to be familiar with the Bible (29 out of 41). This should be remembered for the following analyses as well.

Moving on to the analysis of the four groupings, recall that the pre-test scores for the adult onsite group was not normally distributed. Thus, a Kruskal-Wallis test was run to check for significant variation across the four groups. This returned a p value of .020 supporting

statistically significant variation meriting further investigation. The post-hoc pairwise comparisons revealed that the only significant difference ($p = .024$) was between the adult online and traditional onsite groups with a difference in means of 5.36. Overall, the traditional onsite students scored higher than any of the other groups (1.80 higher than traditional online and 4.18 higher than adult onsite). This probably reflects the fact that the vast majority of traditional onsite students at the university come from Christian backgrounds and thus have greater starting familiarity with the New Testament than the population of adult students.[3]

Post-test Scores

The post-test scores aim to measure students' knowledge of the New Testament as they leave the course. The presentation and analysis of these scores will set the stage for analyzing the differences between the pre-test and post-test scores in the next section. As with the pre-test scores, the post-test scores will first be considered according to the three sets of pairs: online and onsite students, adult and traditional students, and students who are familiar and unfamiliar with the Bible. Table 6 provides the number, mean score, and standard deviation of the post-test scores as well as the results of the T-test for significance and the partial eta squared score for effect size.

Table 6

Paired groups post-test scores

Group	Number	Mean	Standard Deviation	T-test	Partial Eta Squared
Online	39	22.26	5.320	.555	.014
Onsite	40	23.00	5.818		
Adult	38	20.47	5.114	.001	.125
Traditional	41	24.63	5.238		
Familiar	38	24.97	5.248	.000	.135
Unfamiliar	41	20.46	4.965		

Similar to the pre-test results, the post-test shows statistically significant differences between the adult and traditional groupings ($p = .001$) and between the familiar and unfamiliar groupings ($p < .000$), but both have relatively small effect sizes ($\eta_p^2 < .2$). The traditional and the familiar students scored approximately 4 points higher than their adult and unfamiliar counterparts. The analysis of the online and onsite groupings revealed no significant difference.

When turning to the four groups, one must recall that the scores of the traditional onsite students were not distributed normally on the post-test. Thus, a Kruskal-Wallis test was run to check for significant differences, and it returned a value of .013 supporting some significant difference. Similar to the pre-test analysis, a post-hoc pairwise comparison shows a significant difference between the traditional onsite and adult online post-test scores ($p = .035$). Again, the traditional onsite students scored higher than all the other groups (5.37 more than the adult

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[3] The possible causes of slightly lower scores among the traditional online students are not clear from the available data.

online, 4.51 more than the adult onsite, but only 1.18 more than the traditional online). Overall, these results present a close parallel to the pre-test results: groups who scored significantly higher on the pre-test also scored significantly higher on the post-test, and the four groups stayed in the same rank order. This brings us to the next dimension of the analysis.

Pre-test to Post-test Difference

While the pre-test and post-test scores provide some interesting information about the starting and ending points of various groupings, the pre-test to post-test difference seeks to analyze the amount of learning that took place during the course. The very interesting result here is that there was no significant difference among any of the groupings' difference in scores from the pre-test to the post-test. The mean scores for all of the groupings were between 6.68 (for those unfamiliar with the Bible) and 7.52 (for the traditional online students)—less than 1 point difference overall. The *p* values for all of the T-tests of the paired groups (adult/traditional, online/onsite, and familiar/unfamiliar) were well over .05 and often above .80, and the effect size scores were all under .10. Recalling that the adult online differences were not normally distributed, the Kruskal-Wallis result was .735, which supports retaining the null hypothesis of no difference. As an aggregated whole all students improved from the pre-test to the post-test by approximately 7 points no matter how they might be grouped. For example the adult online students improved from approximately 13 on the pre-test to approximately 20 on the post test, and the traditional onsite students improved from approximately 18 on the pre-test to 25 on the post-test. Furthermore, no significant differences appeared when the various groups were measured by how they performed on the various sections of the pre-test/post-test (backgrounds, contents, and theology). Improvement occurred at the same rate for all groups across all the dimensions of the test.

However, the mean scores only reveal one dimension of the results. A review of the scores provided on Table 3 reveals further notable dynamics. The standard deviations and ranges in each case are rather large, especially given the mean score of approximately 7. The standard deviations for each group are larger than half the mean, pointing to the fact that 68% of the scores fell approximately between 2 and 12. Ranges also stretch rather widely from 14 points among the adult online students to 18 points for the adult onsite and traditional online students. Thus, even with a mean score of approximately 7 obtaining across all of the groupings, there appears to be a wide range of scores within each group from students with little to no improvement to those who doubled their score from the pre-test.

Paper Scores

In addition to the pre-test and post-test scores, every student wrote a nearly identical final paper. These papers were all graded on the same rubric as discussed above (resources, description, synthesis, application, and writing). Similar to the pre-test to post-test difference all significance tests with any of the groupings (e.g. online or onsite, and the four groups) returned values greater than .05, and all effect size scores were less than .10. However, some similar dynamics seen above appear here but less pronounced. The traditional students' mean score of 82.21 was 3 points higher than the adult students' mean score of 79.21 (even though *p* = .169). Also, the traditional onsite students' score of 83.45 was approximately 4 points higher than both the adult online (mean of 79.00) and adult onsite (mean of 79.50) students (*p* = .510 and .563

respectively). This led to a closer look at the various categories on the rubric. No significant differences were found in any of the paper categories across any of the groupings with one exception. The scores for the adult and traditional students were significantly different in the resources category ($p < .000$ and $\eta_p^2 = .295$). The adult students had a mean score of 14.79 and the traditional students had a mean score of 18.26 in this category. Thus, the statistically insignificant difference in the mean total paper scores noted above seems to be explained primarily by a statistically significant difference in how well adult and traditional students employed course resources in their papers.

Discussion and Implications

This investigation studied a single course employing different modalities and aimed at students from a range of demographic backgrounds. Thus, it is interesting that the scores for the pre-test, post-test, and paper were all distributed normally. This diverse sample of students and courses still resulted in fairly predictable distributions. However, within some of the groups diversity emerged that generated non-normal distribution. The adult onsite students' scores on the pre-test were distributed bimodally, probably indicating the presence of a few students with strong Christian backgrounds alongside others with little exposure to the Bible. The traditional onsite student scores also did not distribute normally largely due to the impact of a handful of very high performing students. This points to variation that may be due to individual aptitude or achievement. Finally, the adult online difference between the pre-test and post-test also did not distribute normally. However, this may belie a weakness in the study methodology since some online students seemed to take the post-test quickly just to earn the completion points. The paper totals were distributed normally across all the groups and a majority of final grades fell between C- and B+. The very even and balanced results of this broad and summative assessment indicate good achievement of course outcomes across all the categories.

Several conclusions follow from this analysis based on both the presence and absence of significant results. This sample confirms that adult and traditional students enter IWU with notably different levels of knowledge about the New Testament. We saw a moderately strong correlation with adult students identifying themselves as unfamiliar with the Bible and the opposite with traditional students identifying themselves as familiar with the Bible. This is borne out in a significant difference with the pre-test results as well where traditional students scored approximately 4 points higher. This raises the question about the approach and contents of New Testament Survey. The accelerated sections cover less of the New Testament than their conventional length counterparts for traditional students because of the reduced instructional time. Thus, adult students enter the course knowing less about the New Testament and leave being exposed to less of the New Testament in comparison with the traditional students. Since experience in the subject matter is a key factor in determining whether to use an andragogical or pedagogical approach (Jarvis, 1993; 2004), the traditional students' familiarity with the Bible probably merits more of an andragogical approach building on their knowledge of scripture and developing the skills of analysis and application while the adult students' lack of familiarity calls for a more pedagogical approach to increase their knowledge base and emerging interpretive skills. Implementing these could improve in the various versions of New Testament Survey and result in increased learning for both sets of students

As noted above, across all of the various categories of analysis students improved from the pre-test to the post-test by a mean score of approximately 7 points, regardless of their initial

score on the pre-test. This is a fascinatingly consistent result given the different starting points, demographic backgrounds, and modalities employed in New Testament Survey across IWU. However, it also raises further issues. First, while all students improve at nearly the same rate, final scores are definitively impacted by the student's starting point. Second, the traditional onsite students must recall instruction from over a 14 week period while all the other groupings are recalling information from only a 4-5 week period. This may point to a higher degree of sense and meaning leading to more enduring long term memory storage (Sousa, 2001, pp. 46-51). Third, this result means that adult students and those unfamiliar with the Bible (recalling that these two groupings have significant overlap) end up *leaving* the course with only a slightly higher score (about 2-3 points) than where traditional students and those familiar with the Bible *began* the course. The improvement is significant and important but it should be considered if this is adequate to help adult/unfamiliar students reach the institutional outcomes of "ethical and Christ-like values and worldview." Fourth, the standard deviation and the range of the pre-test to post-test difference were both rather large. This seems to indicate a broad array of individual achievement. Some students excelled and some students performed poorly across all the various groupings. This may indicate that student aptitude and effort may play a large role regardless of demographics or modality.

The results on the total paper score were also very similar across all the groupings with no significant differences. Thus, neither demographics nor modality had any noticeable impact as students wrote a summative paper describing, synthesizing, and applying the major theological perspectives of the New Testament covered in the course. It is interesting, however, that the adult students with their presumed emphasis on real-life application of knowledge (Knowles, 1970; 1998) performed no better than their traditional counterparts in applying New Testament material to relevant, contemporary circumstances. This is even more startling given the fact that several learning activities unique to the adult accelerated sections specifically aimed to facilitate connections between the New Testament and life or career of students as part of good andragogical practice (e.g. group presentations). Again, this may suggest that the andragogy/pedagogy distinction may not hold up so well here because of the different starting points of the traditional and adult students. Traditional/familiar students may be better prepared for the move to application while adult/unfamiliar students may need more basic instruction for comprehension. Finally, the one significant difference on the final papers was the significantly better use of course resources (Bible, textbook, and lectures) by traditional students. The approximately 65 hours of additional instructional time for the traditional students may have provided them the opportunity for broader and deeper interaction with the course materials that enabled them to use more of those materials in more relevant and appropriate ways on the final paper.

These results have relevance to other courses, especially introductory and general education courses, beyond the specific focus on the New Testament. This study suggests that prior familiarity with the content is a key factor in deciding when and how to aim at lower level learning outcomes with more "pedagogical" strategies or higher level learning outcomes with more "andragogical" strategies. Placement tests could help group students in more appropriate sections, or instructors could survey students at the beginning of the course as a guide to selecting the most beneficial materials and teaching strategies. The results raise issues about the benchmarking of broader outcomes when dealing with such a wide variety of students. Larger outcomes at the program and institutional level might do well both to establish a minimum degree of accomplishment (e.g. all students who graduate from IWU can do . . .) and to measure

the degree of growth over time (e.g. students who graduate from IWU tend to grow in these ways . . .). The minimum standard would certify the gains of students entering with lower levels of familiarity or aptitude and the documented growth would celebrate the work that the university does with students who have more background and capacity. Next, this study questions the andragogical principle that adult learners should be taught with methods stressing application. If application is addressed prematurely before more basic learning outcomes are met even in adults, then that instructional effort may be less effective and could be better used on scaffolded tasks appropriate to their level of familiarity and skill no matter what the content area. Finally, while accelerated classes have shown effective achievement of course outcomes, students unfamiliar with the subject matter will have a steeper learning curve with materials and textbooks, and this should be accounted for in class planning.

Limitations and Further Research

This investigation includes a limitation that faces many studies of classroom performance—the subjects were not randomly selected and placed into various sections of BIL 102, and this may skew the results due to issues of self-selection. However, one of the aims of this study was to see if different materials and approaches specifically targeted to a particular group of students worked equally well in achieving course outcomes across the various incarnations of the course. Another limitation emerged in the analysis of the post-tests. Some students clicked through the test in less than 5 minutes in order to earn the completion points. This may reflect a degree of carelessness on the part of some students who were seeking to check off a task, and this may have lowered the overall scores on the post-test. The pre-test/post-test was also somewhat biased toward the adult students in that it did not ask questions about material that was covered in the conventional and compressed sections but simply could not be fit into the time allotted for the accelerated sections (e.g. additional information about the Gospels, additional Pauline letters, and some General Epistles). A more comprehensive test could be used to explore the total learning of the traditional students in comparison with the adults in accelerated courses.

The study design set the author as the creator and instructor of all the courses. This offered some control on the variables of content and instructor performance, but it also brings certain limitations. The single instructor may have produced a levelling effect on scores across the courses that would not be seen in a wider sample of students with differing instructors. Future investigations could include more students, instructors, and sections to see if similar dynamics of performance across the various modalities and demographics obtain when not controlling for the instructor variable. Also, adding other raters on the final papers could provide greater objectivity and validity to these scores. Such a broader analysis would help to measure the effectiveness of this general education course across the institution.

Finally, as this study surveyed the impact of demographics and modality on the achievement of students in New Testament Survey, it raised the issue of how learning in this introductory course helps students to reach the larger institutional learning outcome of explaining, demonstrating, and applying "ethical, Christ-like values and worldview." The pre-test to post-test improvement across all categories reflects increased knowledge about the contents of scripture, but the adult/unfamiliar students still lagged behind their traditional/familiar counterparts. This raises two questions. What is the relationship of knowledge about the New Testament and the development of and "ethical, Christ-like

worldview," and do the lower (yet improved) scores of the adult/unfamiliar students reflect adequate progress toward this goal? The final paper components of theological synthesis and application link more directly to the goals of Christ-like values and character, and all categories of students demonstrated solid performance in these areas. Yet, adult/unfamiliar students typically appear have more ground to traverse than their traditional/familiar counterparts to reach these higher order results. This raises the following question: can IWU employ the various modalities with greater sensitivity to demographics to capitalize on the background of traditional/familiar students and intensively serve the growth of adult/unfamiliar students? New Testament Survey is the one undergraduate course at IWU that cuts across modalities and demographics to move all students further toward "ethical, Christ-like values and worldview." Counterintuitively, employing approaches associated with andragogy for younger but more biblically literate traditional students and approaches associated with pedagogy for older but less biblically literate adult students may serve both groups better in their progress towards this goal.

Acknowledgments

References

Austin, M., & Gustafson, L. (2006). Impact of course length on student learning. *Journal of Economics and Finance Education*, *5*(1), 26-36. Retrieved March 20, 2014 from http://www.economics-finance.org/jefe/econ/Gustafsonabs.pdf.

Cranton, P. (1992). *Working with adult learners*. Toronoto: Wall and Emerson.

Davenport, J. (1987). Is there any way out of the andragogy morass? *Lifelong Learning: An Omnibus of Practice and Research*, *2*(3), 17-20.

Delmarter, S., Gravett, S. L., Ulrich, D. W., Nysse, R. W., & Polaski, S. H. (2011). Teaching Biblical Studies Online. *Teaching Theology & Religion*, *14*, 256-283. doi: 10.1111/j.1467-9647.2011.00719.x.

Driscoll, A., Jicha, K., Hunt, A., Tichavsky, L., & Thompson, G. (2012). Performance and satisfaction in an online versus a face-to-face introductory sociology course. *Teaching Sociology*, *40,* 312-21. doi: 10.1177/0092055X12446624.

Frick, T. W., Chadha, R., Watson, C., & Zlatkovska, E. (2010). Improving course evaluations to improve instruction and complex learning in higher education. *Education Technology Research & Development*, *58*, 115-36. doi: 10.1007/s11423-009-9131-z.

Galyon, C. K. (2012). Are undergraduate students ready for online learning? A comparison of online and face-to-face sections of a course. *Rural Special Education Quarterly*, *31*(4), 25-31.

Garrison, D. R. (2011). *E-learning in the 21st century* (2nd ed.). New York: Routledge.

Gurung, R. A. R., & Schwartz, B. M. (2009). *Optimizing teaching and learning: Practicing pedagogical research*. Malden, MA: Wiley-Blackwell.

Holland, G. S., & Webster, J. S. (Eds.) (2012). *Teaching the bible in the liberal arts classroom*. Sheffield: Sheffield Phoenix Press.

Holmes, G., & Abington-Cooper, M. (2000). Andragogy vs. pedagogy: A false dichotomy? *Journal of Technology Studies*, *26*(Summer-Fall). Retrieved March 3, 2014 from http://scholar.lib.vt.edu/ejournals/JOTS/Summer-Fall-2000/holmes.html.

Holtz, B. W. (2003). *Textual knowledge: Teaching the bible in theory and practice*. Jewish Education Series, vol. 1. No city: Jewish Theological Seminary of America.

Jarvis, P. (1993) Pedagogy, andragogy and professional education. Paper presented at the International Conference on the Training of Adult Educators, Wadham College, Oxford.

Jarvis, P. (2004). *Adult education & lifelong learning: Theory and practice* (3rd ed.). London: Routledge Falmer.

Knowles, M. S. (1970). *The modern practice of adult education*. New York: Association Press.

Knowles, M. S. (1998). *The adult learner: A neglected species* (3rd ed.). Houston: Gulf Publishing.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (1998). *The adult learner: The definitive classic in adult education and human resource development* (6th ed.). Boston: Butterworth-Heinemann.

Lee, N., & Horsfall, B. (2010). Accelerated learning: A study of faculty and student experiences. *Innovative Higher Education*, *35*, 191-202. doi: 10.1007/s10755-010-9141-0.

Lutes, L., & Davies, R. (2013). Comparing the rigor of compressed format courses to their regular semester counterparts. *Innovative Higher Education*, *38,* 19-29. doi: 10.1007/s10755-012-9226-z.

Merisotis, J., & Phipps, R. (1999). What's the difference? Outcomes of distance vs. traditional classroom-based learning. *Change: The Magazine of Higher Learning*, *31*(3), 12-17. Doi: 10.1080/00091389909602685.

Merriam, S. B., & Caffarella, R. (1999). *Learning in adulthood: A comprehensive guide* (2nd ed.). San Francisco: Jossey-Bass.

Bruehler, B.B.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review*, *94,* 247-52. Retrieved June 8, 2014 from http://dx.doi.org/10.1257/0002828041302244.juyt8

Sousa, D. A. (2001). *How the Brain Learns* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Sussman, S., & Dutter, L. (2010). Comparing student learning outcomes in face-to-face and online course delivery. *Online Journal of Distance Learning Administration*, 13(4). Retrieved March 20, 2014 from http://www.westga.edu/~distance/ojdla/winter134/sussman_dutter134.html.

Swenson, C. (2003). Accelerated and traditional formats: Using learning as a criterion for quality. *New Directions for Adult and Continuing Education*, *97*, 83-92. Doi: 10.1002/ace.91.

U. S. Department of Education, Office of Planning, Evaluation, and Policy Development (2010). *Evaluation of evidence-based practices in online learning: a meta-analysis and review of online learning studies*. Washington, DC: U. S. Government Printing Office. Retrieved March 10, 2014 from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf.

Vreven, D., & McFadden, S. (2007). Success rates for students taking compressed and regular length development courses in the community college. *Community College Journal of Research and Practice*, *34*(1-2), 39-54. doi: 10.1080/10668920903385806.

Walvoord, B. E. (2008). *Teaching and learning in college introductory religion courses*. Malden, MA: Blackwell Publishing.

Webster, J. S., Runions, E., Gallagher, E. V., Lopez, D. C., McGinn, S. E., Penner, T. C., & Howell, D. B. (2012). Student learning outcomes for biblical studies in the liberal arts. *Teaching Theology & Religion*, *15*, 262-83. doi: 10.1111/j.1467-9647.2012.00807.x.

Wlodkowski, R. (2003). Accelerated learning in colleges and universities. *New Directions for Adult and Continuing Education*, *97*, 5-15. doi: 10.1002/ace.84.

Wlodkowski, R. J., & Ginsberg, M. B. (2010). *Teaching intensive and accelerated courses: Instruction that motivates learning*. San Francisco: Jossey-Bass.

Bridging theory to practice with classroom rounds

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Abstract: Pre-service candidates' perceptions of how to teach were challenged after going through the process of Classroom Rounds, the process that was used in this study. Classroom Rounds consisted of a pre-conference meeting with an in-service teacher, followed by a classroom observation of that teacher, and finally a discussion focusing on proven evidence-based practices. The pre-service candidates had the opportunity to share their observational data and beliefs about teaching with that experienced classroom teacher, and then they learned the practical context of research-based pedagogical practices in a classroom setting. Rounds, in combination with clinical experience, extended the pre-service candidates' awareness of research-based practices, conveyed the importance of these practices, and showed specific techniques for implementing these practices in their classrooms. The positive impact these observed practices had on the pre-service candidates' classroom procedures were later revealed in surveys that they completed after their student teaching.

Keywords: *Pre-service candidates, folk pedagogy, pedagogical practices*

Bridging Theory to Practice with Classroom Rounds

Many pre-service candidates enter their senior year of college with the belief that they not only have mastered educational theory and learned all pedagogical techniques, but also have ascertained sufficient content knowledge to teach in a classroom setting. Their desire to be teaching in a real classroom rather than sitting in another college class is palpable. The dilemma for teacher educators is how to change the pre-service candidates' overreliance on intuitive/tacit pedagogical knowledge, or on teaching as they themselves were taught, and convert them to implementing the concepts and practices learned in university courses (Torff, 1999). This dilemma led to the research question for this study: Can Rounds visits in classrooms influence pre-service candidates' perception of teaching by lessening their reliance on intuition and increasing their use of research-based practice?

Purpose of the Study

The university faculty responsible for teaching content methods created this study to learn ways to dislodge and reorganize the pre-service teachers' intuitive approach to teaching by giving the pre-service candidates glimpses into the real work of teaching through the use of Classroom Rounds. The term *Rounds* in this study represents a method similar to the medical model in which residents observe practicing doctors examining patients, pose questions, and then receive responses based on data presented by the doctors. The educational Rounds model uses three stages: pre-service candidates first have a conference with a classroom teacher, then they

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observe and collect data on an actual teaching episode, and then they have a post-conference to engage in professional reflection (Del Prete, 2006). Grounded theory emerging from sensitizing concepts was the theoretical framework for this study (Bowen, 2006). By using this inductive methodology, the researchers hope to find themes regarding candidates' reliance on intuitive/tacit knowledge of teaching and increase their use of research-based pedagogical strategies. Data provided from this study should benefit both educational researchers and methods faculty in schools of education.

The literature researched for this study examined what has been and is currently being done with Classroom Rounds in teacher education. The content methods faculty conducting this research questioned how to move the pre-service candidates beyond their simple reliance on observed teaching practices that they personally experienced as students to a greater reliance on those practices that were research-based. The literature has clearly noted the impact of classroom Rounds on pre-service candidates. This study sought to extend the findings to examine the jump from intuitive teaching to research-based practices.

Rounds models

In the medical profession, grand rounds are an integral feature of physician training. During rounds, medical residents learn clinical reasoning skills and develop knowledge of specific pathologies through observations of patient cases and discussions with experienced physicians pertaining to those patient cases. The medical models have been structured in a variety of ways, but they were traditionally conducted bedside and included clinical examinations of patients. More currently, rounds are likely to include presentation of data on particularly intriguing cases, with no patient interaction (Thompson & Crooner, 2001).

Rounds in Teacher Education Settings. The term *Rounds* has been drafted into the educational professional development lexicon from medical education. There are various strategies incorporated into Classroom Rounds, but each strategy strives to develop professional knowledge through analysis of data from specific clinical cases. Previous work by Virtue (2009) found the Rounds strategy had benefits in challenging assumptions about English language learners and suggested incorporating Rounds into teacher education programs. Thompson and Cooner (2001) documented Rounds working with pre-kindergarten through 4th grade professional development schools. They found that this strategy improved educational practice by providing "first-hand experience in observing, questioning and reflecting on the 'best practice' strategies of master teachers in a collaborative and supportive environment" (p. 87). Thompson and Cooner also noted that mentor teachers found questions from pre-service candidates equally helpful in reflecting on their personal instructional practice.

During Rounds sessions at Project Zero, classroom teachers closely examined student work and discussed issues about project-based learning (Blagg, 2009). In another variation of Rounds, superintendents observed classrooms and engaged in collegial evidence-based conversations on pre-identified problems (Rallis, Tedder, Lachman, & Elmore, 2006). Based on this work (Rallis et al., 2006), groups of Scottish teachers and administrators then commenced "learning rounds," classroom observations followed by evidence-based discussions, in order to learn about and from school practices (Graham, 2008).

The standards set up by the National Council of Accreditation of Teacher Education Professional Development School (PDS) called for learning opportunities for all stakeholders. It was recognized that Rounds had the potential to provide collegial learning opportunities which

were often lacking in schools (Lortie, 1975; Sarason, 1996), created a channel for communication about educational practice between school and university faculty, and provided all participants with occasions for situated learning in context of practice (Lave & Wenger, 1991; Thompson & Cooner, 2001, Ladson-Billings, 2008).

    The pre-service candidates' educational program in this study. During their first year, all pre-service candidates at this university take part in their first field placement. They are assigned focused field observations related to teacher standards, as well as reflective papers based on observations of teaching and learning, and they investigate the concept of teaching and student learning through other specific assignments. Sophomore year stresses the connections that their class readings and assignments have to their second field placement, and this year also includes tutoring, as well as a case study conducted at an urban partner school. The junior year field experience engages pre-service candidates in the process of teaching itself. They prepare lesson plans, tutor small groups, co-teach, and then solo teach one class session. During the fall of their senior year, pre-service candidates enroll in content methods courses. These courses are content specific, with the emphasis on research-based strategies and methods, and pre-service candidates incorporate these elements into units of study. Figure 1 summarizes and details the flow of the fieldwork required at this university. Additionally, Figure 1 notes when data were collected during this study.

Figure 1. Adolescence to Young Adult Program.
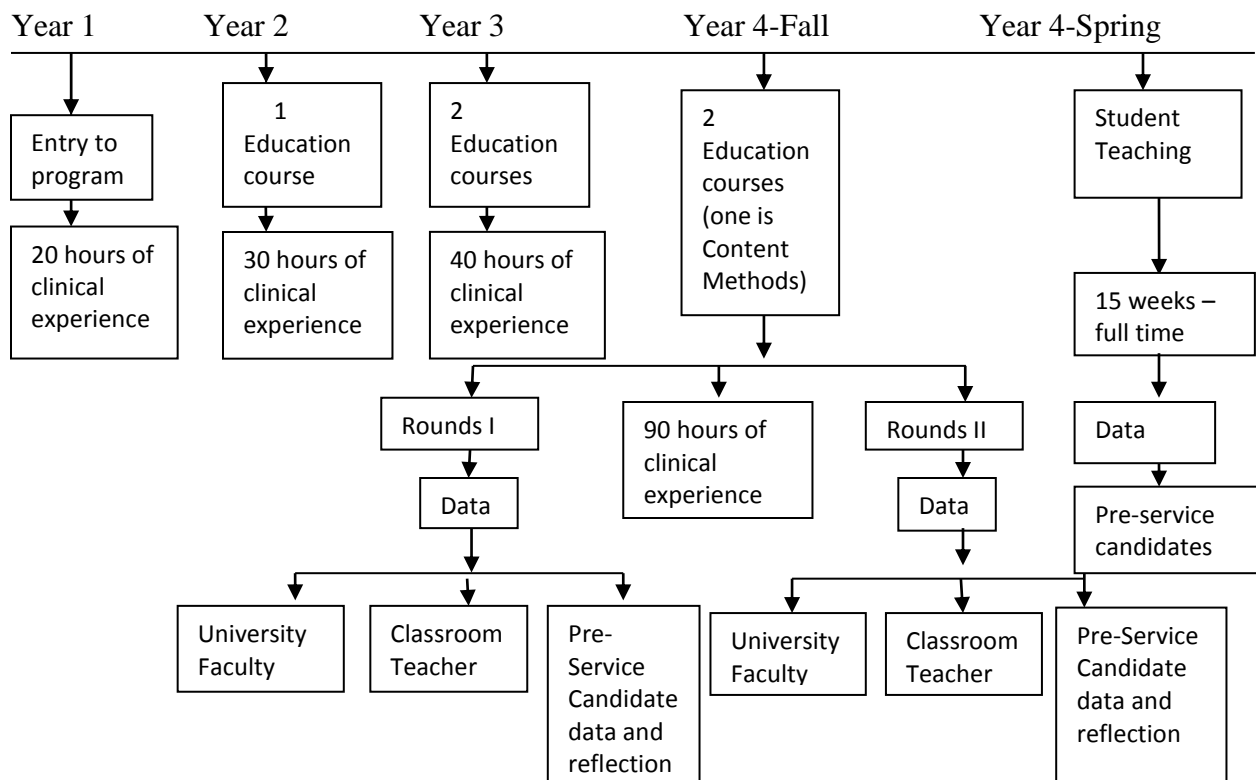
    The progression from first year to senior year moves from focused observations to the development of a teaching repertoire, and it involves many steps: one-on-one tutoring, small group tutoring, whole group teaching, simulations, and micro-teaching. All experiences lead to student teaching. The fall semester of the senior year engages the pre-service teachers in half-day

teaching for six weeks. The pre-service teachers co-teach lessons, move on to solo teaching, and then progress to student teaching for fifteen weeks the following semester. All the time spent in preparation fieldwork finally comes to fruition for the pre-service teacher with the connection of theory to practice taking center stage in the classroom during student teaching.

For this study, Rounds I occurred at an urban partner school during the senior fall semester and early in the methods course. It was followed by a 90-hour field placement that lasted for six weeks. Pre-service candidates then returned to their methods courses and participated in Rounds II, scheduled at the same urban school.

Definitions of classroom observation methods

The types of classroom observation methods taught to the pre-service candidates were provided in a seminar prior to Rounds. During this seminar, students practiced each of the following methods to ensure they could use each one effectively:

1. The selective verbatim technique (Acheson & Gall, 1987) scripted one aspect of classroom discourse, tracking either what the teacher was saying or how the students responded.

2. Verbal flow (Walsh, 2002) kept track of whom was participating in classroom discussions. No scripting was done; instead, a symbolic classroom seating chart was used, with arrows showing the flow of questions/responses or the flow of discussion among the teacher and students.

3. Engagement time (Gibson & Dembo, 1984) used letters (on = o; off task = ot) to represent student actions in class during a specific time frame.

4. Question typology (McNamara, 1981) recorded all questions posed by the teacher during the designated time and then analyzed the questions according to categories.

5. Class traffic (Everston & Smithey, 2000) followed the movements of the teacher on a seating chart, noting where the teacher stopped to work with students.

6. Interactive analysis method (Amidon & Hough, 1967) tracked the teacher's classroom behaviors with students within given timeframes by using coded categories that the teacher and observer had determined beforehand.

7. Global scan method (Wainwright, Flick, & Morrell, 2003) required the observer to write anecdotal notes as events happened within the classroom.

Method

The most frequently referenced pre-service Rounds model was developed by Del Prete (1997, 2006) at Clark University in Massachusetts. The model included a pre-observation discussion of the planned lesson, an observation, and a post-observation discussion among pre-service candidates, teachers, and college faculty. For this study, Del Prete's model was used, along with ethnographic methods for data collection.

The Research Question

This ethnographic study investigated the impact of Rounds before and after a clinical experience, and post-student teaching, to learn if Rounds could diminish the pre-service candidates' reliance on intuitive/tacit knowledge of teaching and increase their use of research-based practices. A qualitative design was chosen as the methodology for this research because it provides the basis for a substantive theoretical question (Bogdan & Biklen, 1992). The research question is: Can Rounds visits in classrooms influence pre-service candidates' perception of teaching by lessening their reliance on intuition and increase their use of research-based practice?

Procedure

The study began with visits to classroom teachers based on two content areas: English and mathematics. Procedures followed the Del Prete model (2006). After each Rounds visit to schools, the pre-service candidates answered a set of questions about their observations on the teaching and pedagogy that occurred during the visit. This was accomplished in person during the following content methods class. Then, at the end of their student teaching during a final seminar, the pre-service candidates completed a survey asking what pedagogical practices observed during Rounds were used during their student teaching. This main research question guided the document review and the interviews with key informants. The interviews elicited the perceptions of the key informants as they participated in the Rounds episodes. Key informants included classroom teachers who had taught during the Rounds episodes, pre-service candidates who had observed and collected data of the teaching event, and university faculty who had taught methods courses and who had taken notes on the pre-service candidates' activities.

From the document reviews and interviews, case studies were developed. Case studies were chosen because of their "usefulness in making human actions and interventions more effective and by its practical utility to decision makers, policy makers and others who have a stake in efforts to improve the world" (Patton, 1990, p. 12). Sensitizing concepts became evident from the case studies that produced themes. Qualitative research best captured the voices of the key informants.

Participants

This Rounds model implementation studied the Adolescence to Young Adult (AYA) English Language Arts and Mathematics pre-service teachers. The demographic data follows in Table 1.

Five high school teachers were observed: one mathematics teacher, observed three times; four English teachers, each observed one time. The teachers observed had five to ten years of experience in classroom teaching. These numbers represent the total number of senior pre-service candidates enrolled in the methods courses for mathematics and English Language Arts. Our goal was to observe content-specific classes, and the expertise of the researchers was in the areas of English Language Arts and mathematics. This limitation kept the numbers of participating pre-service candidates low. The number of teachers observed in this study was based on the availability of the teachers and their schools' policies regarding visitors to the school buildings.

Table 1

AYA Program Participants in the Study

Program Year	Language Arts		Mathematics		Total Students for the Program Year
	Female	Male	Female	Male	
1	10	2	4	3	19
2	12	0	7	3	22
3	7	3	5	0	15
Totals	29	5	16	6	56

Setting. The school used in this study is an urban charter high school associated with a large, urban school district and a Midwestern university. The mission of the school is to prepare inner-city students who are from the first generation in their families to attend college. One hundred percent of the graduates are accepted at either a two-year or four-year college. Enrollment is sustained year to year at a rate of 90–95%. The ratio of students to teachers is 8:1. The composition of the student population is 83% African American, 12% Caucasian, 2% Hispanic, 2% Asian, and 1% other populations.

Preparation of pre-service candidates for the study. To prepare the pre-service candidates for active participation in the Rounds observations, seminars were conducted in which ethnographic data methods were introduced. These observation methods included: selective verbatim, verbal flow, time-on-task, question typography, class traffic, interaction analysis, and global scan.

The researchers, who were the content faculty, employed Del Prete's (2006) three-part process for Rounds: a pre-observation conference, a classroom observation, and a post-observation conference. During the pre-observation conference, the pre-service candidates and university faculty met with the classroom teacher to review the lesson plan, to ask questions about the content of the lesson, to get an explanation of the planning process, to identify lesson objectives, and to discuss the rationale behind the selected pedagogies that would be used in the classroom. The teacher requested that the pre-service candidates observe a specific aspect of his or her teaching to assist the teacher's professional growth. For example, one teacher requested that pre-service candidates record data of whether every student was engaged through the questioning process. After a 55-minute observation and data collection, a post-observation conference was conducted. The candidates had many questions for the teachers after the observation regarding classroom procedures, strategies, and how the teachers handled specific student behaviors and why.

In addition to these observational techniques, the content methods faculty created a set of questions completed by the pre-service candidates when they returned to their methods class the week following Rounds. The purpose of the questions was to provide a focus for the pre-service candidates' reflection on data from the observations. These questions included the following:

1. What did you learn about teaching from your observation of the classroom lesson at the urban charter high school?
2. What did you learn about students in a classroom?
3. What new pedagogical methods/practices did you observe?

4. How are you planning to incorporate student-centered teaching into your classroom?

Data Collections

Data collections occurred at five points during the academic year. The first data point was the pre-service candidates' observation notes, the university faculty's notes, and the classroom teachers' comments from Rounds I. The second data point involved the pre-service candidates' written reflections in response to guided questions. During Rounds II after the five-week field experience, the third data point was the candidates' and faculty observation notes and the classroom teachers' comments. The fourth data point was the candidate reflections in response to the guided questions. The fifth data point was a questionnaire that was administered following completion of a 15-week student teaching experience at the AYA Capstone seminar (Herrelko & Bowman, 2011) regarding the impact of the Rounds sessions on their student teaching experience and on their future teaching.

Data were collected from two sources: pre-service candidates and university faculty. Faculty notes and pre-service candidates' notes and reflections were used. During the observation, pre-service candidates collected data responding to the teacher's request and focused on the questions distributed during the methods class. These were collected for the researchers' data review of themes regarding what was noted by the pre-service candidates. Following the Rounds, pre-service candidates completed a reflection paper in their next methods class that was given to the researchers. Reflections written during methods classes were collected for data sorting. The faculty notes were records of what the pre-service candidates were doing, what they attended to during the observation, and what assistance they offered to the students in the classroom. Using the combination of the collected pre-service candidates' observation notes and reflections, and the faculty notes, there were a variety of data to be sorted for themes.

Data Analysis

Sensitizing concepts have been regarded by researchers as being useful for providing a focus to guide qualitative methods (Blumer, 1979; Denzin, 1989; Patton, 1990). In this study, our knowledge of content, of pedagogical methods, of strategies, and of the relevant research served as sensitizing concepts and influenced our data analysis. Analysis for themes was conducted using card-sorting techniques of the pre-service candidates' responses on the observation sheets and of their reflections. The analysis was conducted to identify categories and to note if differences existed between the responses made pre-observation and those made post-observation. Each of the five sets of data were analyzed and examined for common terms and themes.

Findings

After the researchers examined the data and reflections following Round I, they noted three categories emerged, presented here in descending order of the number of times mentioned: classroom management techniques, strategies used to present content, and fast assessment techniques.

Classroom management techniques. Pre-service candidates identified elements of classroom management that were covered in their university classes. Their data identified when

students were on task or off task, defined by the pre-service candidates' interpretation of what on task required (i.e., correct responses to questions). They noted how the teacher controlled the classroom with specific practices, such as the techniques the teacher used in calling upon students when they had questions, needed help, or wanted to answer a question (e.g., hand raising, raising a card).

Strategies for content presentation. The pre-service candidates identified and recorded many of the instructional strategies used by the in-service teachers. These included the use of smart boards, advanced organizers, visual aids, video games, and collaborative learning strategies. The pre-service candidates recorded these strategies for their use and noted them in their reflections.

Fast assessment techniques. The formative assessment methods used by the in-service teachers were identified by the pre-service candidates as "easy assessment methods." These methods included having the students use thumbs up for understanding the presented information, thumbs down for not grasping the information, and thumbs turned sideways for not fully understanding the information. Another classroom teacher implemented colored cards, with three differing colors representing the same three levels of understanding as the thumbs-up method. The use of yes/no slips to indicate understanding was a third method listed. And a fourth method was noted several times by the pre-service candidates: the use of white boards to alert the teacher to student responses throughout a classroom.

Faculty recorded observations. The researchers reviewed the university faculty's data from the pre-observation meetings between the pre-service candidates and the classroom teachers. The faculty noted that the pre-service candidates asked few questions of the teacher following the teacher's explanation of what would be taught. This lack of questioning was noted by one faculty member and then contrasted with the pre-service candidates' interactions with the in-service teacher after the observation. The teacher had asked that the pre-service candidates observe to whom she was asking the most questions, where she focused her instruction, and if she worked with one group of students more than the rest of the class. This in-service teacher wanted a neutral party observing her classroom practice in order to improve her practice. Another teacher asked that the pre-service candidates observe what level of questioning the teacher used. In fact, each in-service teacher asked that different teaching practices be observed. The faculty noted what the pre-service candidates did during the class itself, such as taking notes and being involved with the students.

Rounds I

In the mathematics and English classrooms, each teacher had requested that the pre-service candidates observe and collect data on the students' engagement based on the questions asked by the classroom teachers and students. Each of the pre-service candidates selected his or her own coding system and tracked as many students in the classroom as possible. The coding defined behaviors and interactions between classmates as well as between the classmates and the teacher. The pre-service candidates took notes on what was happening in the class during instruction, which produced the listing of classroom practices that they had been taught and that they had applied in their university classes. Their reflection papers summarized their data collections and observations into readable form.

The concern about how to manage students in the classroom while presenting abstract concepts was a concern that the pre-service candidates noted in both the mathematics and English Language Arts methods classes and a concern that their reflection papers emphasized:

- It's not new, but having the day's schedule on the board (although never discussed) kept the students on track and informed.
- The teacher was moving quickly through the bell work on grammar errors and the group presentation forced students to pay attention.

There were several observations regarding teaching strategies that the classroom teacher used:

- I learned about having to pay attention to those both with questions and those 'without.'
- I saw an actual example of using scaffolding to help a student get the right answer instead of just telling them.
- Questioning strategies are vital to a student's ability to learn a concept w/o the teacher giving an answer.

No one made an observation about assessment techniques in the English class, but one pre-service teacher in the mathematics classroom noted this about assessment techniques:

- By giving prior knowledge quizzes and surveys that test what my students already knew about a topic being introduced, I will start my lessons where the majority are and I can differentiate the instruction.
- I also saw another example to adapt the use of exit slips when time is not as planned.

In the post conference discussion, the pre-service candidates asked many questions that concentrated on the "why" of strategy selection. All of the pre-service teachers wanted to know details about how the lesson was structured and planned. They asked for the purpose of the lesson beyond fulfilling state mandates. The teachers were very open and explained their rationale for selecting the pedagogical strategies and practices. One teacher noted that "In prior years, I delivered the content by lecture and my students failed to master the content. I wanted to use something different this time that was related to their world to test if this engagement would help them grasp the concept." The pre-service candidates were impressed that this experienced teacher would share her failure to help students learn and her attempts to improve her instruction.

Concerns about classroom management appeared in all the reflection papers written by the English pre-service candidates. Pre-service candidates were surprised at the simple techniques used by teachers. In the 8th-grade English Language Arts classroom Rounds, one observer wrote the following comment:

- The teacher stopped teaching and said "I'll wait." Then she paused for about 10 seconds and the students returned to their task.

Another set of Rounds conducted in a 10th-grade English class led to this statement:

- I was surprised at how focused the students were and the groups worked well together.

The researchers' review of the pre-service candidates' notes and reflections found that the majority reported what they saw, but that there were no references to any connections to their practice. The pre-service candidates stated that Rounds were an opportunity to see an authentic teaching episode in their field teaching and to see some different ways to present content.

Rounds II

Card sorting of the classroom notes and reflections produced after Rounds II turned up the same thematic categories as those in the pre-clinical experience, but these categories appeared in a different order of concern, from highest to lowest. This time the major concern was

with teaching strategies, followed by classroom management, and then assessment techniques. The nature of the notes was more detailed, providing rationales and giving suggestions for what could be done in the future or when they used the technique. These descriptive details noted the pre-service candidates' new ability to analyze and synthesize the strategies they observed.

One example of such analysis and synthesis occurred during a pre-observation conference interview with the mathematics teacher following the candidates' 5-week clinical experience. The pre-service candidates were very wary about asking questions regarding mathematical terminology being used in a lesson—even though they did not understand it. The university faculty recognized the blank stares of the pre-service candidates and asked the teacher to explain what a "dot product" was and how it was calculated. After the classroom teacher's explanation, the pre-service candidates had many questions for the teacher; most of them focused on what to do when a teacher is required to teach new content with which the teacher is not unfamiliar. In response, the classroom teacher noted resources to use and cautioned the pre-service candidates about terminology changing from one textbook to another. Then the teacher requested that the pre-service candidates engage with the students to assist them in their practice with the mathematical process of dot product calculations during Rounds II.

In the English post-observation conference session of Rounds II, the pre-service candidates shared data that noted one section of the class that had not been involved in the lesson or discussion. The teacher had asked the pre-service candidates during the pre-observation conference to monitor participation and active engagement of this section of her class. After pre-service candidates shared their data, the teacher told them that their data were accurate and noted that this one section's lack of involvement was a daily occurrence. The teacher and pre-service candidates then discussed the data presented, came up with possible reasons for disengagement, brainstormed some solutions, and then settled on a possible response. The teacher took their suggestions and stated she would implement the change and report back to them with the results. The pre-service candidates were very surprised that the teacher took their suggestions, and they began to understand that they were viewed as colleagues by the teachers.

The reflection papers from Rounds II presented a broader view of each observed classroom. The pre-service candidates identified methods and strategies used by the teachers and discussed how these supported student learning. They added the rationale for using the selected methods and strategies in their responses. The responses were more in-depth, noting how they would use the strategy, or how they had used it during their clinical experience, and offering detailed reasons for doing so. The pre-service candidates during Rounds II asked more questions of the teachers concerning practice and theory than they had during the Rounds I session. They were now asking "Why" and "How" questions of the teachers. They were connecting theory to practice in reference to the observed teaching episodes:

- Why did you select that strategy?
- I do not understand how this fits with the content standards.

Teaching strategies noted by the pre-service candidates were the most frequent comment in Rounds II. Following are two examples of pre-service candidates' responses:

- The importance of questioning and examples especially to correct students' misconceptions. Relate math concepts to actual life to grab students' attention. The importance of being able to think on your feet, and when to ask the students WHY problems are solved in a certain way.

- Student-centered classrooms are essential for learning. By focusing on students and taking on the role of facilitator in the room, allows them to lead discussions and pose questions.

Comments made by the pre-service candidates regarding classroom management included the following:

- Time management is an issue and seemed to know when to move on, when to help the student and when to just give information.
- Class traffic is something that I observed in classes. It is interesting because I never thought how important it is to move around the classroom not only for classroom management, but to make sure students know you are there to help.

Regarding assessment techniques, the mathematics and English pre-service candidates only noted one observation from each group:

- Pop quiz bell ringers can serve as a formative assessment and give students an idea of how much they need to study the material.
- The three check points for the research paper are excellent. This lets students know where they are, what is needed, and where they need to be prior to completing the projects.

In the post-observation conference discussion, the pre-service candidates were more at ease with the teachers. They shared data, identified difficult elements of the lesson, and discussed how teachers were building on students' prior knowledge to assist them with the new content knowledge being introduced. The pre-service candidates noted the scaffolding used by the teachers to help students construct meaning.

Post Student Teaching

At the end of the student teaching semester, pre-service candidates took part in a required final seminar. Data for the university was collected and the pre-service teachers completed state required surveys. It was during this seminar the researchers asked the AYA mathematics and English Language Arts pre-service candidates to respond in writing to the following two questions:

1) List any ideas/techniques that you observed during Rounds that you used during your student teaching.
2) Identify two methods/strategies that you observed during Rounds that you intend to use in your teaching practice.

The end of student teaching surveys demonstrated the long-term impact of Rounds on pre-service candidates. Four categories emerged from the responses: strategies, assessment, classroom management, and technology.

Strategies. The responses detailing various strategies that they observed during Rounds noted how they employed the strategies during student teaching and that these strategies helped to focus the work of students on specific content. When asked which areas will these pre-service candidates use in their practice, they identified the research-based teaching strategies as of prime importance for their own classrooms.

Assessment Techniques. Assessment techniques and technology were noted for use in their own classrooms. The importance of assessment dropped for these pre-service candidates from the semester prior to student teaching.

Classroom Management. Pre-service candidates noted how the teachers were managing their classrooms and included the research as to why these techniques worked. They identified the use of multiple strategies for keeping the students on task, having posted classroom procedures and consequences as two means of management. In their reflections they identified links to research, such as the work of the Canters regarding classroom management.

Technology. The area of technology was noted as being important to their own classrooms. These pre-service candidates were very familiar with social media. How they use technology in the classroom to help students generate knowledge products will be the new arena in which to create teaching strategies.

The high-impact memories that the pre-service candidates held and used in their student teaching focused on teaching strategies and how to engage students in their content areas. During the observations and use in their student teaching, classroom management was the second most important concern. There was a switch between observed and used assessment techniques from student teaching to what they will use in their own practice. Assessment issues were of greater concern for implementation when these pre-service candidates are in their own classrooms. Technology use was not mentioned either in the observations, nor how they implemented it in their student teaching; however, several mentions were made about how to use technology in their own classrooms in the future. A notable element from their reflections was the comparison of one observed teacher with another in the same content area. While the two observation dates were weeks apart, the pre-service candidates were able to recall the actions of one in-service teacher and compare those to another in-service teacher. This observation identifies the need for the faculty to involve more in-service teachers in the program for the pre-service candidates to observe. At the conclusion of their student teaching, the candidates completed surveys providing information regarding the impact of Rounds on the practices used by them during student teaching and also regarding what they planned to do with information learned during the Rounds observations.

Conclusion

During Rounds I, pre-service candidates identified elements of classroom management, teaching strategies, and easily identified assessment techniques recently covered in their methods course. During the mathematics Rounds, the pre-service candidates were looking for correct answers to the mathematics. The English pre-service candidates were focused on how the content was presented to engage students. Their concerns about classroom management, teaching strategies, and assessment techniques were at a very novice level. The pre-service candidates were at the very basic levels of Bloom's taxonomy, using knowledge and application frequently. They knew and recognized techniques of classroom management, teaching strategies, and assessment when the elements were in front of them. However, pre-service candidates had never applied them in a classroom. That experience was to come in their clinical experience.

The methods faculty were encouraged that the pre-service candidates did know these pedagogical areas when they observed them. It meant that they were aware of these practices. After reading and analyzing their notes and reflections, it was apparent that the pre-service candidates could interpret what good teaching practice included. Figure 2 identifies the levels of Bloom's Taxonomy that the pre-service candidates used when taking notes and in their reflections about their observations during Rounds I and II.

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Rounds I   Rounds II
Knowledge   Analysis
Application   Synthesis

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Figure 2. Blooms Taxonomy pre-service candidates used in Rounds Observations.

Following the five-week experience, Rounds II produced data that were at a higher level of Bloom's Taxonomy. Their notes provided detailed analysis of what teachers did and why, as well as a synthesis of pedagogical techniques with their content. The notes were written by pre-service candidates who had the experience of planning and conducting classes for five weeks. Clearly the pre-service candidates were now recognizing and synthesizing the work in the classrooms with the research-based practices of the teachers. These were identified in the statements that noted why strategies about pop quizzes could be used as formative assessment, and the effectiveness of using questioning to identify student misconceptions. Their vocabulary changed too, making use of more academic language and pedagogical terminology. They were concerned about implementing content standards, time management, scaffolding, and student-centered classrooms with teachers as facilitators. Their skill at analysis and synthesis of classroom teaching with the pedagogical concepts taught in methods class was evident in the reflection papers.

The use of Rounds for pre-service candidates helped the university faculty determine where the pre-service candidates stood in their professional growth before an extended clinical experience and after that same experience. While the pre-service candidates believed that they were ready to teach in any classroom prior to the clinical experience, their reflections noted new understandings of the depth of pedagogical strategies needed in the classroom today.

The reflection papers from these pre-service candidates support Del Prete's (2006) model for linking practice experiences with theoretical learning about teaching. These case studies extend the work of Thompson and Crooner (2001), providing evidence that, when placed in a collaborative and supportive environment, pre-service candidates do experience the real world of teaching with students and classroom issues present. They learn to work with colleagues and to use academic language on the job. Pre-service candidates can debrief, asking the teacher being observed the "why" questions about selection of lesson content and responses to students. Immediate feedback during the debriefing meeting following Rounds classroom observation helped the pre-service candidates learn the why of planning and classroom management.

Future studies should be done on more extensive use of Rounds in a methods curriculum. For example, can a methods course cover all the aspects of teaching required by the learned societies with just Rounds visits? Do the Rounds visits have the same impact without a clinical experience? Studies in the future can test these elements for effectiveness.

What is the impact of Rounds on pre-service candidates' perception of teaching? In this study, Rounds used as defined clearly served as a means by which the pre-service candidates were able to share their thoughts with an experienced classroom teacher and observe how pedagogical practices could be used in a classroom. Rounds, in combination with the clinical experience, extended the pre-service candidates' awareness of research-based practices and the importance of these practices. Rounds served as a model for the pre-service candidates on the "how" of applying instruction, classroom management and assessment to authentic classrooms. Lastly, our grounded theory now defined Rounds as a means of demonstrating theory and

practice at its best: the university and the school working together as a means to prepare pre-service students for future classrooms.

Limitations, Implications, and Future Research

We selected an ethnographic approach to this research because we needed to learn what influence the Rounds visits had on pre-service candidates' perception of teaching. Were the pre-service candidates gaining pedagogical content knowledge from the visits to observe practicing teachers prior to and after a ninety-hour field experience? Limitations arose in three areas: the number of participants both for pre-service candidates and practicing teachers, the self-reporting in the surveys, and the locations used.

The number of pre-service candidates was based on those who self-selected into the specific content areas of AYA English Language Arts and mathematics for their licenses. In the past, when our enrollment in the AYA program was high, these numbers would have been over 40 pre-service candidates. With the present enrollment, our numbers are much lower. However, we still need to learn the significance, if any, to the required pre-service candidates' program. All participants took part in the research; no pre-service candidate asked to opt out of the research.

Finding teachers who were willing to be participants in this research was more of a challenge than we anticipated. This research required a good amount of the teachers' time. Teachers had to write lesson plans in a format that the pre-service candidates would be able to follow during the flow of the class instruction. Teachers had to schedule pre-observation as well as post-observation meeting times. Only one mathematics teacher was open to asking her school principal for this time for meetings and was willing to write out her procedure. Fortunately, this mathematics teacher had nine years of experience that she shared with our students. Having more teachers to observe would have contributed to the pre-service candidates' observation of multiple teaching practices and classroom management techniques.

Finding principals willing to have groups of pre-service candidates enter their school buildings and premises was an issue we had not considered when making our requests for participation. The principals had to grant permission, allowing a flow of additional people into the building and space for the pre-observation and post-observation conferences. With the security issues that schools now face, we were delighted with the principals and teachers who allowed us to work in their buildings. This could be an issue in future research.

The researchers created the surveys to focus on what they wanted to learn from the pre-service candidates. When completing the surveys, the time involved with responding to the questions and the limited number of questions could have led the pre-service candidates to focus their replies on one direction rather than relying on a free flow of information if they had not been given guiding questions.

The implications from this study suggest that structured observations of teachers help develop pre-service candidates' thinking regarding the usefulness of research-based pedagogical practices. As a result, the researchers are seeking more scheduled time during the fall semester for their candidates to observe and interact with teachers in a Rounds setting. Conducting methods classes within a school setting might allow for more frequent Rounds to occur.

This ethnographic research enabled these researchers to discover what pre-service candidates focused their attention on both at the start of intense field experiences and after those experiences. This information will help them and other university faculty tailor their methods classes to include more research-based pedagogical strategies for English Language Arts and

mathematics methods classes. The results of this research should enrich any education courses taught during senior year to pre-service candidates.

References

Acheson, K. A., & Gall, M. D. (1987), *Techniques in the clinical supervision of teachers: Preservice and inservice applicatons.* White Plains, NY: Longman, Inc.

Amidon, E. J., & Hough, J. J. (1967). *Interaction analysis: Theory, research, and application.* Reading, MA: Addison-Wesley Pub. Co.

Blagg, D. (2009). Rounds for teachers. In Harvard Graduate School of Education. Retrieved from http://www.uknow.gse.harvard.edu/teaching/TC103 607.html.

Bogdan, R. C., & Biklen, S. K. (1992). *Qualitative research for education*. Needham Heights, MA: Allyn and Bacon.

Bowen, G. A. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods. 5(3),* 1-9.

Bulmer, M. (1979). Concepts in the analysis of data. *Sociological Review, 27*, 651-677. doi: 10.1111/j.1467-954X.1979.tb00354.x

Del Prete, T. (2006). The "Rounds" model of professional development. *From the Inside, Fall* (1), 72-73.

Denizen, N. K. (1989). *Interpretive biography: Qualitative research methods series.* (Vol. 17). Newbury Park, CA: Sage Publications, Inc. doi: 10.4135/9781412984584

Everston, C. M., & Smithey, M. W. (2000). Mentoring effects on proteges' classroom practice: An experimental field study. *The Journal of Educational Research, 9(5),* 299-304.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation-time to bring out positive student change. Journal of Educational Psychology, *76(4),* 569-582. doi: 10.1037/0022-0663.76.4.569

Herrelko, J., & Bowman, C. (2011). Building an adolescence to young adult capstone course. *The Ohio Journal of Teacher Education, 24(2),* 24-30.

Ladson-Billings, G. (2008). A letter to our next president. *Journal of Teacher Education, 59*(3), 235-239. doi: 10.1177/0022487108317466.

Lave, J., & Wenger, E. (1991*). Situated learning: Legitimate peripheral participation*. Cambridge, MA: Cambridge University Press.

Lortie, D. C. (1975*). School teacher: A sociological study* (2nd ed.). Chicago, IL: The University of Chicago Press.

McNamara, D. R. (1981). Teaching skill: The question of questioning. *The Journal of Educational Research, 23*(2).

Patton, M. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Rallis, S., Tedder, J., Lachman, A., & Elmore, R. (2006). Superintendents in classrooms: From collegial conversations to collaborative action. *Phi Delta Kappan, 87*(7), 537-545. doi: 10.1177/003172170608700720

Sarason, S. (1996*). Revisiting "the culture of the school and the problem of change."* New York: Teachers College Press.

Thompson, S., & Crooner, D. D. (2001). Grand rounds: Not just for doctors. *Action in Teacher Education, 23*(3), 84-88. doi: 10.1080/01626620.2001.10463078

Torff, B., (1999). Tacit knowledge in teaching: Folk pedagogy and teacher education. (195-213). In *Tacit knowledge in professional practice: Researcher and practitioner perspective*. Ed. R.J. Sternberg, J.A. Horvath. Mahwah, NJ: Earlbaum & Assoc.

Virtue, D.C. (2005). A visit to ESOL Island: Notes on a shadowing experience with middle level English language learners in South Carolina. *South Carolina Middle School Journal* 13(1), 42-44.

Wainwright, C. L., Flick, L. B., & Morrell, P. D. (2003). Development of instruments for assessment of instructional practices in standards-based teaching. *Journal of Mathematics and Science Collaborative Explorations*, *6,* 21-46.

Walsh, S. (2002). Construction or obstruction: Teacher talk and learner involvement in the EFL classroom. *Language and Teaching Research*, *6(1),* 3-23.

Challenging, eye-opening, and changing U.S. teacher training in Korea: Creating experiences that will enhance global perspectives

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Abstract: This case study explored the short-term international experience of preservice teachers to create and enhance global perspectives. These teachers (n=5), all female graduate students at a university in the U.S., were fully immersed in a foreign culture for three weeks while teaching English to primary and secondary students in Korea. Pre-, during-, and post-data were collected to investigate how the participants work and live while being completely immersed in a new culture. Eight themes emerged from the analysis of multiple qualitative instruments: (a) language barrier, (b) being the minority, (c) cultural differences and cultural shock, (d) student participation and teaching methods, (e) classroom management, (f) underestimation of English language learners, (g) finding confidence as a teacher and instructional flexibility, and (h) support systems. Overall, teachers expressed a transformation in both their teaching philosophy and cultural perspectives despite the short duration of the experience. They also reported that this linguistic and cultural immersion not only advanced their global perspective but also provided them with the necessary tools and understanding to work with diverse populations more emphatically and effectively. The findings suggest that additional teacher training is needed to increase preservice teachers' cultural competence and responsiveness to better address the needs of today's diverse student populations.

Keywords: immersion programs, multicultural education, diversity, cultural awareness, professional growth, teacher training

Introduction

Around the world the public school system is becoming further diversified year after year (Kambutu & Nganga, 2008). The modern day classroom, from elementary through secondary levels, is comprised of students from various cultural and language backgrounds (Echevarria, Vogt, & Short, 2008). In the United States, as the diversification and expansion of public school students continues at a rapid pace, the majority of teachers remain white, English speaking, middle class females (Glazier, 2003). In addition to the homogeneous teaching population, the teacher's own culture is often used as the norm in a classroom. Using the teacher's culture as the standard for the class may cause cultural misunderstandings (Kambutu & Nganga, 2008). The current shifting cultural landscape of the United States suggests that disproportionate representation will get worse before it gets better, and educators and policy makers cannot ignore this issue in fear of underserving a large part of the population. Disproportionate representation as a phenomenon is particularly problematic considering that the school-aged population in this

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country is becoming culturally and linguistically diverse and at an unprecedented rate (Klinger et al., 2005).

The National Center for Education Statistics' (NCES) 2012 report, *The Condition of Education 2012*, outlines this current cultural shift. According to the report, the percentage of public school students that identified as a racial or ethnic minority rose from 33% in 1990 to 46% in 2010, a jump of 13% in 20 years. Conversely, the percentage of students enrolled in public school that identified as White or Caucasian declined during the same time frame, from 67% in 1990 to 54% in 2010. All regions of the United States - Northeast, Midwest, South, and West - experienced the influx of culturally diverse students during this time with the West experiencing an impressive 35% increase of culturally diverse students (National Center of Education Statistics, 2012). These trends show no signs of abating in the near future.

Looking into the future, the National Center of Education Statistics projects that by the year 2020, the student population identified as White is expected to continue to decline, while there are expected increases for the public school enrollment of Black, Hispanic, Asian/Pacific Islander, and American Indian/Native Alaskan students (National Center for Education Statistics, 2012). Clearly, disproportionate representation of culturally and linguistically diverse students is going to continue to be an issue in the field of education in the United States.

Compounding the issue is the fact that most culturally and linguistically diverse students are served by teachers that do not share a common background. Currently in the United States, 83% of full-time teachers are White while 7% are Black, 7% are Hispanic, and 1% are Asian (National Center for Education Statistics, 2012). As classrooms fill up with more and more diverse students, the potential for problems of student achievement and teacher effectiveness are apt to arise between students and the generally White teacher population (National Center for Education Statistics, 2012).

These facts paint a picture of how diverse our schools are around the country, but they do not answer the question of how well we are preparing our teachers to work closely with these students, their families, and their communities. In addition, the research remains inconsistent with regard to how educators develop cultural competence in order to meet the needs of diverse students (DeVillar & Jiang, 2012). Few qualitative studies address how international short-term teaching experiences abroad shape preservice teachers' cultural understanding and outlooks on the world (Mahon, 2007; Merryfield, 2000). The present study addresses this gap by providing the participants with an opportunity to explore their own cultural identities, examine their biases toward other cultures, and experience what it means to be the minority in a foreign country.

Teacher training at the university level has begun to include classes on multicultural education, teaching diverse learners, early literacy, and bilingual education. Current research suggests the need to further expand professional teacher development to work with diverse student populations (Alfaro & Quezada, 2010; Cruickshank & Westbrook, 2013; DeVillar & Jiang, 2012) and the need to understand how immersive programs impact preservice teachers professionally (Brindley, Quinn, & Morton, 2009; Lee, 2009; Malewski, Sharma, & Phillion, 2012). The present study provides insights into the reflective practice of five preservice teachers gaining teaching experience in Korea and describes how they refined their teaching skills and how the struggle with challenging situations prompted transformation in terms of their cultural attitudes and pedagogical approaches.

The present study was guided by the following research question: What changes are evident in preservice teachers' thinking, their attitudes, and their behaviors as a result of a teaching abroad experience?

Background

During the mid- to late 1970s, the National Council for the Accreditation of Teacher Education (NCATE) in the U.S. recommended that teacher education programs (TEP) begin to include classes on multicultural education (Banks & McGee Banks, 2006; James, 1978). These courses are designed to provide training for teachers to work effectively with diverse groups of students whom they will teach and support every day in their classrooms. Although learning the theories and best practices by reading and discussing these in an academic setting provide an overview of the topic, teachers may need more than just a theoretical understanding. Of course, these teachers are given opportunities to experience fieldwork practicums in settings that are more likely to be similar to their future teaching positions. Even though TEPs include multicultural education for preservice teachers in general and special education programs (Banks & McGee Banks, 2006), Cochran-Smith (2001) pointed out a lack of consensus on how multiculturalism should be addressed in TEPs. Furthermore, Trent, Kea, and Oh (2008) recommended that TEPs need to have a stronger level of commitment in helping teacher candidates to meet the needs of diverse learners.

Research suggests that international field experiences help to prepare teachers to teach in diverse classrooms by expanding their worldview and approach a classroom from a global perspective (e.g., Alfaro & Quezada, 2010; DeVillar & Jiang, 2012; Jiang & DeVillar, 2011; Landerholm & Chacko, 2013; Lee, 2009; Malewski et al., 2012; Sharma, Rahatzad, & Phillion, 2013). Numerous benefits reported in recent research support the need for the incorporation of international teaching experiences into TEPs. We examined these benefits from three broad perspectives, namely culture, teaching, and professional growth.

Culture

International teaching experiences have the potential to create a more critical view of one's country of origin (Malewski et al., 2012; Quezada, 2004), lead to a heightened awareness and appreciation of cultural and linguistic diversity, and prompt a positive attitude toward cultural differences (e.g., Alfaro & Quezada, 2010; DeVillar & Jiang, 2012; Jiang & DeVillar, 2011; Landerholm & Chacko, 2013; Lu & Soares, 2014; Malewski et al., 2012; Sharma et al., 2013). A heightened cultural awareness not only helps to improve the ability to communicate with people of different ethnic backgrounds and navigate in cross-cultural contexts; it may also result in greater empathy toward ELLs due to a deeper understanding of what it means to be the minority with limited language skills and in a greater willingness to teach culturally diverse students (DeVillar & Jiang, 2012; Jiang & DeVillar, 2011; Landerholm & Chacko, 2013; Lu & Soares, 2014; Malewski & Phillion, 2009; Zhao, Meyers, & Meyers, 2009).

Teaching

Numerous benefits have been reported in the area of teaching. An international teaching experience may help to improve educational practice and instructional flexibility (Alfaro & Quezada, 2010; Cruickshank & Westbrook, 2013; DeVillar & Jiang, 2012; Lu & Soares, 2014) and reveal stark differences in student participation (active versus passive) and teaching methods (teacher- versus student-centered teaching) between the schools in their home country and the host country (Chinnappan, McKenzie, & Fitzsimmons 2013). In addition, an international

experience may clarify the understanding of one's own educational system compared with other countries' school systems and may even lead to the transfer of the newly acquired teaching skills and dispositions from country to country (Alfaro & Quezada, 2010). Some teachers have experienced a renewed appreciation of the quality and quantity of instructional materials available within U.S. classrooms and other privileges (DeVillar & Jiang, 2012; Malewski et al., 2012; Sharma et al., 2013).

Professional Growth

Developing the habit of systematically reflecting on professional and personal growth has been a key characteristic in numerous studies (e.g., Cruickshank & Westbrook, 2013; Harbon, 2007; Mahon & Cushner, 2007; Lee, 2009; Malewski et al., 2012; Zhao et al., 2009). Not only has it been suggested that international teaching experiences accelerate professional development (Brindley, Quinn, & Morton, 2009), but they may also have a positive impact on employability (Jiang & DeVillar, 2011) and help to develop a greater level of maturity to deal with circumstances different from daily routines (Lee, 2009).

Research Methodology

The purpose of this case study was to explore what type of additional teacher training is needed in order to best prepare new teachers for today's classrooms. Specifically, we wanted to study certain aspects of how preservice teachers work and live while being completely immersed in a new culture. We investigated whether complete language and cultural immersion for new teachers would help to enhance their global perspective and provide them with the necessary tools and understanding that they need when working with diverse populations. We used phenomenology as a type of qualitative research method, which is aimed at understanding participants' feelings, experiences, and beliefs about the theme in question in order to identify the essence of an experience, for example the participation in a particular program (Merriam, 2009).

The conceptual approach that guided this research is reflective practice "as a means by which practitioners can develop a greater level of self-awareness about the nature and impact of their performance, an awareness that creates opportunities for professional growth and development" (Osterman & Kottkamp, 2004, p. 2). All instruments used in the present study were designed to prompt insight into personal behavior by developing a conscious awareness of one's actions and effects with the objective of facilitating change (Osterman & Kottkamp, 2004).

Participants and Settings

Improving self-confidence, increasing awareness of other cultures, developing global perspectives to teaching, and gaining insight in a different educational system were among the key reasons that the participants applied for the Korea immersion program. Through an extensive interview process, which assessed classroom experience, willingness, interest, and open-mindedness to work and live in a foreign country, four undergraduate preservice teachers and one graduate preservice teacher preparing to become K-12 general education teachers were selected to participate in this study. The five participants, all female, ranging from age 19 to 27, had never before taught in or out of the United States. None of the participants had previously traveled to

Korea. Prior to enrollment, the researcher met individually with each potential participant to explain the goals. Table 1 displays the participant profile overview.

Table 1

Participant Profile Overview

Pseudonym	Ethnicity	Age	Class size (grade level) in Korea	Area of study	Travel experience outside of U.S.
Ellen	White	27	8 (10th – 11th)	English	Japan, Thailand, Vietnam, Italy, Spain
Sue	White	19	7 (2nd – 3rd)	Sociology	Italy, Germany, Austria, France Spain, England, and Mexico
Melissa	White	20	10 (6th – 7th)	Communication	Mexico
Carole	White	21	8 (8th – 9th)	Theology	Australia, England, Spain, Switzerland, France, Germany, Belgium, Ireland, Israel, Italy, Canada
Gina	White	21	7 (4th – 5th)	Communication	Ecuador, Switzerland, Italy, Mexico

Prior to departing for Changwon, Korea, the team, which included the five participants, one professor (the first author), and one program assistant, met on three separate occasions. During these meetings the team was introduced to Korean customs, and a few Korean words, such as greetings and a few polite formulas. Curriculum, scheduling, and class preparations were discussed and determined. There was always an opportunity for participants to ask questions. Each participant lived, worked, and socialized in Changwon for a three-week period. Accommodation was provided on a college campus. From Monday through Friday, they taught English classes with 7 to 12 students ranging from fourth to eight grade from 8 a.m. through 12 p.m. Within this four-hour period, classes for Korean speaking primary and secondary underserved students were conducted in English, with a focus on reading, writing, listening, and speaking with some help from Korean university students who were majoring in English. In the afternoons and on weekends, participants partook in outings (e.g., temples, beach, and shopping), meals, and social gatherings. Practice of the Korean language was encouraged, as was constant communication with local teachers, professors, students, and other professionals. All participants participated in an overnight home stay with a local family where they were further exposed to daily life in Korea.

Data Collection

For data triangulation, a variety of qualitative instruments was used, namely each participant's program application essay, daily self-reflection journals, one-on-one interviews, a group discussion, a postsurvey, and a program evaluation.

Daily journals. While in Korea, participants kept two separate journals to document both their teaching and cultural experiences on a daily basis. In order to prioritize authentic reflection rather than structured responses (Jiang & DeVillar, 2011), the journals had no specific guidelines or questions; rather, participants were asked to write at least one page daily documenting their

experiences, reactions, feelings, struggles, successes, and questions. As all participants were first-time teachers and were staying in Korea for the first time, the two journals served the dual purpose of data collection and a space for their reflections. This writing process not only encourages the writers to share the immediate impact of their experiences, but also to predict its future impact on their personal and profession growth (Jiang & DeVillar, 2011).

Group interview. Approximately a week after arriving in Korea, the researcher conducted a semistructured group interview, which was transcribed. Because phenomenological researchers should strive to put aside their knowledge about the topic under investigation in order to describe the participants' lived experiences accurately (Chan, Fung, & Chien, 2013; Merriam, 2009), the first author asked focusing rather than leading questions and remained alert to the participants' cues, thereby creating an environment conducive to the participants' own introduction of issues. Using the researcher's questions as a guide, a group discussion ensued about the specified topics (i.e., teaching experience, cultural experience, what has been learned, and challenges). Participants were encouraged to answer each question openly and honestly.

One-on-one interviews. One and a half weeks into the trip the researcher conducted semistructured one-on-one interviews, which were transcribed. Each participant was asked to speak about both their teaching and cultural experiences. The purpose of this in-depth interview was to provide a private space to voice personal experiences, concerns, and questions that they may have felt less comfortable expressing during the group dialogue.

Posttrip survey. At the conclusion of the three weeks, a final postsurvey (open and closed items) was distributed to document the transformation that may have occurred as a result of the visit. Specific experiences (e.g., pretrip preparation, teaching, homestay, cultural events, etc.) were ranked on a numerical scale (1=not valuable, 5=very valuable).

Role of the Researcher

As the faculty in charge of this program and the only in the team one who spoke Korean, the first author assumed a variety of roles during this project. He acted as a liaison between the local staff in Korea and his students (the preservice teachers), for example by negotiating the daily and weekly schedules. Twice daily, he informed the preservice teachers of schedule updates and new events. He went to every classroom to help with translating, if needed, and also to check in with the Korean teaching assistants to discuss their roles. On outings, he acted both as an interpreter and as a tour guide. He explained cultural aspects, provided information about food that they were tasting, and he was in charge of transportation, such as buying train tickets.

Data Analysis

In an initial reading of the participants' program application essays, their daily journals journal, the transcripts of both the one-on-one and the group interview, the postsurvey, and the program evaluation, we identified significant statements and clusters of meaning, from which we developed themes. We then wrote a textural description of how one participant experienced her teaching-abroad experience. Finally, we compared the themes across the five participants to better understand the phenomenon, which allowed us to distill the essence from the preservice teachers' common experiences (Merriam, 2009; Sharma et al., 2013). Overall, 56,672 words were analyzed (program application essays: 4,418; cultural and teaching journals: 34,928 words; one-on-one interviews: 7,385; group interviews: 6,656 words; and postsurvey: 3,285).

Making Meaning of Teaching-Abroad Experiences

The following account examines one preservice teacher's process before, during, and after her teaching abroad experience. Using the phenomenological approach, the analysis is based on Melissa's experience of teaching English to 4th to 6th graders in Korea and describes how she was negotiating cultural differences between Korea and the United States, how she coped with unexpected situations in her teaching, and how this experience helped her grow as a teacher. We chose her experience because of the breadth and depth of her reflections. Although her accounts cannot speak for all participants, they are representative of the diversity of experiences and outcomes of this international experience across the five participants. In terms of culture, we identified three themes: (a) language barrier, (b) being the minority, and (c) cultural differences and cultural shock. In terms of teaching, five themes emerged: (a) student participation and teaching methods, (b) classroom management, (c) underestimation of ELLs, (d) finding confidence as a teacher and instructional flexibility, and (e) support systems.

Melissa is a white English native speaking female who grew up in a large family in a privileged suburb in California with a high rate of college graduates. She became interested in becoming a teacher as early as high school where she started to teach Spanish to 5th graders. Compassion, determination, and focus are the three qualities that she used to describe what made her a good candidate for the Korea program. Among the five participants, Melissa is the only one who has barely traveled outside the United States, with the exception of a few mission trips to Mexico with her church to build additions to poor families' small homes. In her opinion, having an open mind, the ability to compromise, empathy, and a cooperative attitude are essential to a productive experience of working and living together. The following accounts are divided into two categories: culture and teaching.

Culture

Language barrier. On the second day, Melissa learns that she is going to teach 6th and 7th graders and that there will be about 10 students. She is concerned about the uncertainty of various aspects, especially about the language barrier. The language barrier has been evident in numerous accounts across all data collection instruments.

> The language barrier is really hard to deal with and I get really frustrated that I can't have a conversation with 99% of the people that we've dealt with so far. It's making me crazy. I have no idea what my students' language level will be like and will find out tomorrow morning. I'm glad that after tomorrow, everything won't be such an unknown and it will be much easier to plan my lessons and activities.

Being the minority. Throughout her cultural diary, Melissa describes her recurring experiences of what it means to be different than the majority. The experience helps her to empathize with the challenges that ELLs experience in the United States.

> We found this place called Caffee Bene and we assumed that it was a coffee shop. When we went in, people literally just stopped in their tracks and stared at us for a good five minutes. It was one of the most uncomfortable things I've ever experienced, but was really funny at the same time.

I got to see the other side of ELLs in American schools, which was overwhelming and difficult. It was something that was good for me to get as a teacher. I had taken the bilingual class but I had never had the experience of being in a different country where I was the minority and didn't know anything. It fully opened my eyes to that. I need to be patient and nice with my students when they don't understand because it was really challenging for me in the beginning.

Cultural differences and culture shock. Initially, Melissa's accounts do not indicate the recognition of any major cultural differences.

Culturally, when we first got there I didn't think it was that different. When we were on our way to the first hotel and I was like this looks just like San Francisco. And everyone said just wait it's going to hit you. And it didn't while we were in Seoul…

But later in the week, there is evidence of Melissa's and her colleagues' recognition of culture shock.

…and we were dying because we couldn't talk to the cab driver and we were like what did we get ourselves into? What are we doing here? Tomorrow we're teaching? Carole was laughing uncontrollably because we were so overwhelmed. Then as the week went on it got so much easier.

Melissa describes her trip to the college campus. Her fears about low housing standards not only reflect her preconceived notions of Korean standards but also turn out to be unjustified.

We weren't expecting much in terms of housing and were honestly just hoping that the toilet was an actual toilet rather than a hole in the ground. Because of this, we were all shocked when we pulled up to a really nice building and were taken to our rooms.

At the end of the first week, Melissa and her colleagues meet their home stay families. The only family member with good English skills is a teenage girl. The rest of the family speaks only a little bit of English. Although Melissa communicates through the teenage girl, there is still a lot of information that cannot be conveyed. The home stay is characterized by a series of events that make Melissa long to go back to the college campus.

Although the family was really insistent that I do everything their way and basically just passed me on to another family who used me to educate and babysit their children, I actually thought my family was really nice (....) I didn't really like the experience overall because I just felt like such an inconvenience to them (....) I'm bummed because I thought that I would get to experience this area with natives and thought that I would see and explore new things. It's just annoying to me that I sat inside ALL day watching movies in the dark because it's something that I could have easily done at home and I just wasted a day here that I could have been out seeing new things. I'm really glad that they ended up changing it to only one night because I wouldn't want to still be there.

When the five participants get back to the college campus, they all share their homestay experiences. Three of the five participants had positive experiences while Melissa and Sue had rather negative experiences due to misunderstandings caused by the language barrier, cultural differences, and divergent expectations.

Teaching

Cultural differences in student participation and teaching methods. Melissa starts teaching on the third day after her arrival in Korea. She describes unexpected situations and recognizes that timing and scheduling have a different meaning in Korea than in the U.S. She learns the importance of being overprepared and the need for flexible and spontaneous decision-making.

> Today we had our first day of teaching. It was the most overwhelming day ever. We were told that we would have an introduction meeting with the kids and their families at 9:30 and it would last about half an hour and we would teach until 11:30 (....) The meeting only took about 5 minutes and then we were sent to our classrooms to begin teaching. Our lessons went way faster than we expected and we were all done by 9:50-10:00--with no other lessons planned. Apparently in Korea, there is no classroom discussion and kids basically just copy from the board the entire day. Because of this, the kids didn't participate at all and it was really challenging. It was like pulling teeth just to get them to introduce themselves. Activities fly by when there is no discussion or sharing among the class and everything that we had planned on discussing and sharing with them was unrealistic and impossible.

Melissa realizes that she had set wrong expectations of her students because it was a voluntary summer program for elementary school children. She had assumed that the kids were going to be very excited about this unique opportunity. On the first day of school, she is shocked to realize that her students are not "into it at all." The cultural differences in student participation between Korea and the U.S. are a recurring topic across all participants' accounts. Melissa describes how she pairs students up in order to encourage oral communication, a strategy that turns out to be only moderately successful, possibly because her class is very heterogeneous both academically and in terms of language development. She articulates appreciation for the help of a native Korean speaking teaching assistant.

> I did a bunch of other little lessons as well and it was hard because they would just stare at me… so I didn't know if they really didn't understand what I was saying, or if they were just pretending not to so that they didn't have to do it.

On the second day, however, Melissa's initial fears that she would never get the students to talk are dissipated and she expresses satisfaction with students' participation and a fun and relaxing lesson. Especially when they play a game, she is surprised by her students' voluntary engagement.

> We even played hangman for a little while and a lot of the kids actually came up to the front of the room and did words; based upon yesterday I didn't think that I would get them to talk at all, let alone come up to the front of the room to write on the board.

Later in the first week, active engagement and the classroom dynamic are still Melissa's main concerns. She purposefully designs her lessons to prompt more interaction.

> I really want my students to participate and have fun in class so I am working on lessons that force them to interact and move around. I would like them to become more comfortable with each other and me because then they will be more willing to let loose. I hope that things continue to slightly improve daily.

Melissa recognizes stark contrasts between teaching methods and students' expectations in the U.S. and Korea.

> After today, I learned that I will be spending the next three weeks modeling and writing down everything that we are doing (....) In their schools here, they don't do any fun activities or group work and based upon what it was like trying to get them to use color and draw on their activities that I'm going to hang in the classroom--I don't think that they are given much space for creativity either. I have my entire lesson plan made for tomorrow and it is much more realistic for this group of kids. I have everything broken down to the minute which won't happen but it's a good starting place and will put me in a much better place tomorrow than I was in today. We were all so overwhelmed today and spent a long time in a team meeting this afternoon discussing what to do tomorrow and how to effectively teach.

Language barrier. The language barrier, which has already been mentioned in the cultural data, is also a recurring theme in Melissa's teaching journal. Despite the help of the bilingual teaching assistant, Melissa is frustrated about her inability to understand what her students are saying. There is, however, evidence that she copes with some of the behavioral issues quite well, for example by changing the seating arrangements.

> I have ten kids in my class--4 girls and 6 boys. 2 of the boys are problems and tomorrow I'm making assigned seats because they can't sit next to each other again-they don't listen or do anything and speak in Korean then laugh all the time. So I have no idea what they're saying and it's the most frustrating thing in the world.

Classroom management. Behavioral issues are a recurring topic with two of her students. Melissa has a turbulent day at school and learns about classroom management. She gets caught in the middle of a fight. Her reflections illustrate the significance of the language barrier and the importance of a bilingual support person, in this case the first author, to take control of a challenging situation.

> As soon as he got to Gun [another boy] he started beating him up--punching, hitting, kicking, etc. Luckily I was right there but ended up in the middle trying to stop it (Gun wasn't fighting back) and got punched twice and pushed. Sinwoo's best friend is also in my class so came back immediately and took Sinwoo outside. I went with them and luckily Dr. Lee [pseudonym for the first author] was walking by and I told him what happened. He told me to go back into the classroom and he would deal with it. The boys got talked to and after a while were sent back to my class (Dr. Lee was in a different classroom and didn't authorize it) for the remaining 30 minutes or so. Sinwoo kept glaring at Gun, so although they were separated, I still went and sat beside him for the 20 minutes of Lion King that we watched. At lunch (which was delivered McDonald's by the way--another gem of Korea), Dr. Lee found out that I got punched (I didn't get the chance to tell him before) and talked to the other people running the program with him. They decided that since it obviously isn't okay under any circumstances to hit a teacher, Sinwoo was going to be suspended for one day.

Melissa demonstrates increased confidence when addressing her students' misbehavior and is renegotiating her authority and identity as a teacher.

> I had some behavioral issues again with two of my boys and got much more authoritative today and made it clear that I am in charge and that things will change if they don't cooperate. I had to split them up, so I made them change seats and sit far away from one another. Once I did that, things got much better because they didn't really have many opportunities for interacting (like talking and messing around). It made the classroom much more relaxed and I wasn't constantly telling them to stop and interrupting other students. I will definitely need to enforce that as soon as they walk in again tomorrow.

In the second week, as she is trying to gain more confidence in her teaching, Melissa expresses satisfaction over her regained authority in case of the two boys who often misbehave. She is happy with her students' progress, both behaviorally and academically.

> I was happy with [names of two boys] today though because when they first came in they sat down together and I immediately told them that although I was going to allow them to sit together in the beginning, if they interrupted anyone or caused any distractions, then they would be moved immediately. I was on alert all day and only had to say something once and they stopped talking immediately. I was glad that they were finally starting to respond to my authority and recognized the fact that I do have power over them and can control their privileges.

Underestimation of English language learners. Although Melissa expresses satisfaction with her students' increased interest, she articulates a sense of underestimation. This is one of the few topics that we could not substantiate across all participants' accounts. Only three out of five participants mentioned underestimation. Melissa's statements indicate the assumption that her students cannot possibly do a task, and she is surprised when it turns out that they can.

> We started the day by reading "Friends Around the World" again and although I thought that it would be a challenge to get them to do it, it went really well. We did a Venn diagram for it as well and I didn't have much hope for that either, but they all saw what to do and completed the assignment (....) It's truly making me realize that I can never make an assumption about how much my students know superficially again. I need to take a step back and consider the fact that maybe they are just shy, have problems focusing, or any number of other reasons.

Finding confidence as a teacher and instructional flexibility. As she is trying to become more comfortable developing her teaching strategies, Melissa articulates her ambiguity about the failure of a writing task she has planned and is determined to find out the reasons and to adjust her strategies to accomplish a better result.

> I was a little frustrated at one point because after going over the different vocabulary words, I asked them to spend the remaining 10-15 minutes before the break writing about their families. I told them that they could write anything—about their parents, siblings, grandparents, cousins, aunts, uncles, where they lived, what they like to do together, names, ages, etc. and left it very open-ended. I even gave them an example of what I would write, so I thought that this would be really easy for them. Either I didn't explain it well enough or they didn't want to do it, because it was really challenging to get them to do it (....) I'm going to work on more writing activities like this throughout the week to see if it's a comprehension problem or just an issue of the fact that they don't want to do it.

In the postsurvey, Melissa revisits various situations that forced her to become innovative and creative, to modify her teaching, and to redefine her identity and findings confidence as a teacher.

> The most valuable teaching experience that I had was probably the fact that we went into the classroom without having much direction or curriculum. We were thrown into the field in a foreign country where we were expected to effectively teach students a new language while we didn't even speak their native language. We were forced to think on our feet and figure out what to do on our own. I got a whole new perspective on teaching and my strategies were definitely strengthened and modified due to this experience. I had to come up with new activities and lessons on my own while maintaining classroom management and implementing them effectively.

Despite (or because of) her struggles with cultural differences, Melissa realizes that she has gained a lot of insights about herself and that this teaching-abroad experience has strengthened her belief in having chosen the right profession. Similar to her colleagues, she articulates the emotional bond that she developed with her students despite the short period of time spent together.

> I learned a lot about myself through this experience because my patience and comfort levels were tested a lot. I realized that I really can get through anything with a positive attitude and a smile on my face and that I will definitely come out okay in the end (....) Overall, I learned that I am more patient and can endure a lot more stress than I thought I could. I learned that I can easily adapt to all new situations, even when things are way out of my comfort zone and foreign to me (....) I learned a lot about myself as a teacher on this trip. I learned that I can handle the pressure of the classroom setting and come up with extra lessons if I need them. I also learned that teaching is absolutely the right profession for me. I love teaching and being in the classroom. I loved all of my students despite all of the challenges that I was faced with. I learned the importance of coming into a classroom over-prepared and how you really need to love what you do in order to be an effective teacher.

Melissa summarizes how her experiences have helped her to develop as a teacher and describes the most useful tools she gained in regard to pedagogy, lesson planning, and classroom management. She describes her class as the biggest challenge. The lack of active participation forces her to modify her teaching style, a struggle that she perceives as being helpful for her future teaching career. Her accounts revolve around eye-opening events, which led to increased self-confidence as a teacher, and the need for both flexibility and determination.

> As the days went on, lesson planning became much easier and I was able to plan for my class more effectively. After this trip, I feel that lesson planning for a class that is fluent in English would be a piece of cake and I'm excited for the next chance I get to create lessons with a specific class and level in mind. I was tested a lot when it came to classroom management (....) I quickly realized that with my class, I needed to become an expert in classroom management immediately. It was really challenging for me in the beginning of our teaching experience because my class wasn't well-behaved and didn't participate at all. After a few days, I learned how imperative it was for me to execute punishments, do everything in my power to keep the class involved and interested at all

times (....) I feel like I could manage any classroom I will be faced with in the future after my experiences in Korea.

Support system. The support system included the college campus staff, the Korean teaching assistants, and the first author. Melissa describes how the support system helped her address challenges caused by the language barrier, classroom management, or low energy levels.

I had a lot of behavioral issues and luckily Dr. Lee was there to help me out with problems when I was overwhelmed. Through his examples, it became clear to me how important it is as a teacher to be strict but kind at the same time. I realized that I was much too easy on the kids and was trying too hard to get them to like me than to enforce punishments and get respect (....) This has been the hardest day yet of teaching. I have never been so grateful that I have had other people to get me through the day.

In the group interview, the first author opened the discussion by asking the preservice teachers to talk about their teaching experience in the first week of the Korean immersion program. The group interview was an opportunity to provide input to each other and to address challenging situations that had arisen in their classroom and in their social interactions with Koreans. Some of the teachers reported that the translations from English into Korean offered by the Korean TAs were sometimes more of a hindrance than help because it results in students' over-reliance on the TAs. As a result, it was decided that the Korean TAs should only provide a translation from English into Korean when the teacher specifically asked for help. It was also noted that Korean students (and teachers too) tend to resist interaction with each other, simply because they are not accustomed to it. The group discussed measures to promote interaction, such as seating rearrangements (e.g., U-shape). The support system provided by each other, the staff on the college campus, and the first author were another important factor that emerged from the group interview. Everyone agreed that their culture shock would have been greater if they had come by themselves with no one to talk to. The group interview also helped to interpret ambiguous situations, which required inside knowledge of Korean customs. A final issue was the perspective of the minority. The preservice teachers realized how it feels to be in a foreign environment, unable to communicate with anyone.

Participants' Recommendations

In the postsurvey, Melissa emphasizes two key reasons why she recommends an international immersion experience to all preservice teachers, namely experiencing a challenge that helps to advance one's self-confidence and experiencing the environment from a minority's perspective. Melissa and her four colleagues recommend that preservice teachers immerse themselves in an international teaching-experience.

I do think that an immersion experience should be required for all teachers because I feel that it really challenges you and forces you to do your best in uncomfortable and unfamiliar situations. It puts everything into perspective for you and you really realize how ELL students feel in a classroom. It gives future teachers a small glimpse into what it's like to be the outsider in a classroom where the language and culture is challenging for you. It helps you to realize that ELL students aren't lazy or not trying, they are just really uncomfortable and faced with overwhelming challenges.

Tables 2 provides an overview of the cultural themes that emerged from the participants' accounts.

Table 2

Culture: Overview of Themes and Key Quotations

Culture Themes	Quotations about Culture
Language barrier	"I was surprised at how homesick I was, and I think it was largely due to the language barrier. I didn't realize how hard it would be to be in a foreign country and not be able to read any sign (….) I didn't realize how difficult it is to constantly try to make my brain understand the language when I have no basis in it. Spanish and other Latin-based languages I can usually make out the general meanings and get by, or at least ask for directions, but Korean is a whole different ballpark. (Gina)
Being the minority	"When I was in 11th grade we had a unit centered on race. For 5 weeks we were divided into white students and students of color. I will never forget the moment when my African American Sociology teacher said, "you will never know what it feels like to be the only black man in a room of all white people." This has stuck with me everyday for the past 11 years and yesterday I finally, literally, understood what he meant. The conference and day as a whole was amazing, but I truly felt like an outsider. I was unable to understand or participate in any conversation. At two very lengthy meals all I could do was sit, eat, smile and chamsahamida. I am making the assumption here that this is probably the most important lesson I will learn on this trip, as I genuinely felt like my ELL students must feel. Understanding the language was impossible and with no visual aids or hand gestures I simply tuned out. I did not care to even feign interest in what was going on (.…) I cannot even imagine what my students, who do not speak the language, are in a new place, are shy, young and insecure, and must feel day in and day out in school. I was the ELL student yesterday and I was completely checked out. We talk so much about providing equal access to students and I now personally understand why differentiated instructions and assessment are so important. Yesterday I learned that as a teacher it is my job to ensure that my students never feel "like the only black kid in a room of all white people." (Sue)
Cultural differences/ Culture shock	"I am at my home-stay as we speak. They are very nice people. The mom is deaf and the grandma lives with them. They have a son who speaks a little English. They took me out to a great dinner and are really nice. Now, I am at their house and they have no beds! It is a pretty small apartment and the mom, grandma, and son all sleep in one room on the floor." (Sue) "Over this week I have gone from 'not sure why I am here' to 'I am ok being here' to 'this is exactly where I need to be.' Its crazy how things can change so quickly when you are traveling." (Carole)

Table 3 provides an overview of the teaching themes that emerged from the participants' accounts.

Table 3

Teaching: Overview of Themes and Key Quotations

Teaching Themes	Quotations about Teaching
Student participation and teaching methods	"The school culture here is so different in Korea than the U.S. It is so teacher-centered here; the kids are used to just listening and copying down what is on the board." (Gina)
Classroom management	"I made a huge mistake as a teacher assuming this. Now that the students are comfortable with me and with each other they (specifically the boys) have begun acting out. They talk non-stop and are disruptive to each other (….) With only two days left, and no rules/consequence structure in place, it is my own fault that this is happening. I definitely have learned that no matter how perfect a class may seem, classroom rules and consequences are critical to establish from the get-go. (Ellen)
Underestimation of ELLs	I gave my first reading comprehension quiz and was pleasantly surprised to see every student get 100% and tell me "that was easy". I was worried that, even though they all know the story, they were not understanding it in English. (Ellen)
Finding confidence as a teacher and instructional flexibility	"I have learned that I am able to do anything if I put my mind to it (….) This experience was one that nobody can learn about in class and I feel that I learned far more doing this program than I ever would in a classroom." (Carole)
	"I discovered the importance of flexibility and back-up plans. This is something I have read about and discussed at nausea, but to have the first-hand experience was crucial. Teaching is only so much about planning, but today I discovered that it is necessary to be a improvisation expert as well." (Ellen)
Support system	"That if I came by myself and didn't speak Korean and didn't have anyone else who did speak Korean or you [the first author] because you translate for us, I don't think it would have been as great of an experience." (Carole)

The participants' program evaluations indicate high overall satisfaction with the experience. They were most appreciative of the teaching experiences and quite satisfied with the cultural experiences. In terms of pretrip preparation, several participants recommended that future program participants should learn Korean before heading to Korea.

Discussion

This study examined ways to prepare preservice teachers to better meet the needs of today's diverse student population. Specifically, we investigated the changes that became evident in preservice teachers' thinking, their attitudes, and their behavior as a result of an international teaching experience. Enlightening, life-changing, challenging, fulfilling, unforgettable, growth, flexible, changing, and eye-opening are some of the eloquent descriptors that the participants used in their narratives to describe their teaching-abroad experience in Korea. The five participants signaled their willingness and openness to immerse themselves in a different culture and appreciated the fund of knowledge that this experience offered, similar to the participants' dispositions described in previous research (Alfaro & Quezada, 2010; Lu & Soares, 2014; Sharma et al., 2013). International teaching experiences offer opportunities for preservice

teachers to experience the impact of a language barrier, what it feels like to be a minority in a foreign environment, and to go through culture shock (Quezada, 2004). As our participants were trying to make sense of their experiences in an unfamiliar culture, their reflections suggest that they were broadening their cultural awareness, understanding, and appreciation, which is an important step in the development of acculturation, that is, in the process of identity shift as a result of contact with a different culture (Kambutu & Nganga, 2008). Through ongoing reflective dialogues with themselves, their colleagues, and the first author, our participants have negotiated cultural differences and reconsidered some of their preconceptions that have previously gone unexamined (Mahon & Cushner, 2002).

All our participants reported key incidents that prompted the recognition of different approaches to teaching and learning (Cruickshank & Westbrook, 2013). Their experience abroad had a positive impact on the development of their confidence as teachers, their pedagogical preparation (Lu & Soares, 2014), and their instructional flexibility (Jiang & DeVillar, 2011). It also strengthened their awareness of different expectations in terms of student participation (active versus passive) and teaching methods (teacher-centered versus learner-centered), a finding that is supported by Chinnappan and colleagues (2013), whose participants were also, initially, faced with a lack of student initiative, an overreliance on textbook replication, and a lack of students' responsibility for their own learning. Due to the lack of student engagement, some of our participants were inclined to make erroneous inferences from their students' language ability to their intellectual understanding, a problem that was also witnessed in Harbon (2007).

Experiencing a new environment from the perspective of an outsider unable to speak the language and unfamiliar with cultural conventions was another recurring topic across all participants. Our participants recognized that this experience was helping them to develop empathy towards ELLs in the United States. Our data align with Lu and Soares (2014) whose findings suggest that acculturated teachers may be better, more empathetic teachers if they have experienced staying in a foreign country as a minority with limited language skills. In regard to language, our preservice teachers were very appreciative of the bilingual support system, which helped to alleviate the language barrier and the culture shock (Quezada, 2004). Despite their struggles, they agreed that they could not have gained the same insights in any other way, a finding that concurs with Landerholm and Chacko (2013).

The participants of this study have experienced culture shock to varying degrees. There are four stages (Oberg, 1960): (a) incubation, (b) crisis, (c) recovery, and (d) complete. Stage one indicates the incubation phase in which a person feels elated about being at a new location. The participants frequently mentioned how they were being treated like celebrities and that they got such better service than they would in the United States. Initially, they reported being very excited and happy to be in Korea. Stage two is the most difficult phase that a person may go through due to the fact that one's normalcy in everyday life has been taken away. During this crisis phase, a person may criticize the host country's culture and people. All participants experienced challenges early on when they realized that the language barrier was forcing them into the position of a minority. They articulated distress at being stared at and all of them were frustrated with Korean food to varying degrees. Although our participants demonstrated their openness to a unique learning experience by signing up for the program, they did not want to lose contact with the familiar, similar to other teachers participating in teaching-abroad programs (Sharma et al., 2013). Their longing for the familiar was evidenced by their craving for American food and the fear of low housing standards in the dormitory. Some participants were taken aback

on the first day of teaching because they had different expectations. The daily contact with their peers and the first author, however, helped to avoid a feeling of isolation (Quezada, 2004). Stage three is the recovery stage. During this phase, one understands and accepts the new culture. All of our participants experienced this phase later in the program while venturing out by themselves. There were occasions when they were able to overcome the language barrier without having to depend on an interpreter, which increased their confidence. Stage four is described as being bicultural, that is, feeling comfortable in two different cultural settings. As we expected during a short immersion trip, our participants did not experience this complete phase.

Conclusion

The purpose of this study was to examine the experiences gained by preservice teachers during an immersion teaching opportunity abroad. Among the five teachers who traveled to Korea, all five have expressed their new found convictions about their chosen teaching career and the confidence gained while working with ELLs. At the beginning, we asked how we could best educate today's preservice teachers when both teachers and students come from such different backgrounds. The participants acknowledged that they learned far more in this overseas immersion program than they would have by taking a class in multicultural awareness. Research indicates that the skills and dispositions gained during international teaching experiences easily transfer to other settings (Alfaro & Quezada, 2010). Our data indicate that these five preservice teachers were determined to transfer their newly acquired knowledge and insights to the schools where they will be working closely with diverse groups of students.

Education and teaching preparatory programs have a responsibility to provide a global perspective beyond the classroom. With culturally relevant pedagogy at the forefront of proven student success (Duncan-Andrade, 2009), preservice teachers must be given opportunities to genuinely understand the reality of frustrations and even oppression that ELLs experience early on in their schooling. The international experience illustrates how the processes of reflection may have assisted preservice teachers in fulfilling the most important goal: being able to support student learning. The opportunity for daily reflection has honed their capacity to re-examine their beliefs more critically, which may have helped them to grow as teachers. This type of overseas immersion program may be an outlet for teacher training that adds an enrichment experience for multicultural education. The experience of feeling unaccustomed to a different culture and the frustration of being unable to communicate freely with others is likely to be a valuable learning experience for preservice teachers. Teacher educators will need to understand what impact such an experience may have on future teachers of the United States. Future teachers should be allowed to have more self-realization moments than merely being exposed to theories and teaching methods.

The lack of perspectives from the Korean students as well as their parents and host families, the short program duration as well as the small number of participants with homogeneous backgrounds are some of the limitations of this study. The study was conducted in Korea; therefore, if replicated in a different cultural setting, results may vary. Similarly to Chinnappan and colleagues (2013), we assumed that the pre-trip preparation had been sufficient to prepare the preservice teachers for their Korea experience, but their comments have challenged this assumption. Finally, for future programs, it would be a valuable asset to investigate how this experience impacted the students in their own future classroom in a follow-up interview, similar to Malewski and colleagues' (2012) study.

Appendices

Appendix A. Program Application Questions.

1. Why are you interested in participating in the Korea Immersion trip?
2. Briefly describe your experience(s) in working with school-aged children.
3. Identify 2-3 qualities about yourself that make you a good candidate for this program.
4. Have you traveled abroad? If so, for how long and what was the purpose of this travel?
5. Have you lived in/visited climates that were hot and humid? How did you handle it?
6. What are your experiences with students from varying socio-economic backgrounds?
7. Describe your experiences of community living/working. What do you think are essential elements among a group that would make for a healthy/productive experience of living and working together?

Appendix B. Guiding Questions Group Interview.

1. As a group you're going to talk about how your teaching is going. Just talk about what you're going through from the first day to now, which is the third day. Then you're going to talk about any cultural things you've experienced that highlights this trip…from Seoul to coming to Changwon. Open talk, discussion.
2. So for all of you…how did you feel about going into teaching right away on Monday? What was your initial experience? What were some of your feelings or expectations?
3. Do you think this experience is going to help you in your own classrooms in California?
4. Culturally, what are some things you are experiencing or have experienced that are good and that are difficult? What is working really well and what is not?
5. If you came by yourself to this university do you think you'd be more culture shocked?

Appendix C. Guiding Questions One-on-One Interview.

1. The first question is about your teaching and your experience here and how it is going for you and the second part is your cultural immersion. So, how's your teaching going?
2. From the first day to now, what have you learned about yourself in terms of teaching? What kind of style are you using? Has your teaching style from day one to now changed?
3. Have you used a different teaching style than you would have used back home?
4. Will you continue this teaching style or do you think you won't use it as much in the U.S.?
5. What have you been experiencing culturally? What has been fun? What has been difficult?
6. Do you think the Korea experienced changed you in some ways?
7. Do you feel like your trip to Korea prepared you to go abroad?

Appendix D. Postsurvey.

1. What was the most and least valuable teaching experience you had?
2. What was the most and least valuable cultural experience you had?
3. Please describe how your experiences have helped (or not helped) you to develop as a teacher - what were some of the most useful tools you gained in regards to the following: pedagogy, lesson planning, classroom management.
4. What have you learned about yourself as a teacher on this trip?
5. What have you learned about yourself overall on this trip?
6. What was your biggest challenge over the course of this program?

7. Do you think an immersion experience should be required for all preservice teachers? Why/why not?
8. What suggestions do you have for future pre-trip preparation?
9. Do you have any additional suggestions?
10. If you had to sum up your experience in three words, what would they be?

References

Alfaro, C., & Quezada, R. L. (2010). International teacher professional development: Teacher reflections of authentic teaching and learning experiences. *Teaching Education, 21*(1), 47-59. doi: 10.1080/10476210903466943

Banks, J. A., & McGee Banks, C. A. (2006) *Multicultural education: Issues and perspectives.* Hoboken, NJ: John Wiley & Sons.

Barkhuizen, G., & Feryok, A. (2006). Pre-service teachers' perceptions of a short-term international experience programme. *Asia-Pacific Journal of Teacher Education, 34*(1), 115-134. doi: 10.1080/13598660500479904

Brindley, R., Quinn, S., & Morton, M. L. (2009). Consonance and dissonance in a study abroad program as a catalyst for professional development of pre-service teachers. *Teaching and Teacher Education, 25,* 525-532. doi: 10.1016/j.tate.2008.09.012

Chan, Z. C. Y., Fung, Y., & Chien, W. (2013). Bracketing in phenomenology: Only undertaken in the data collection and analysis process? *The Qualitative Report, 18*(59), 1-9.

Chinnappan, M., McKenzie, B., & Fitzsimmons, P. (2013). Pre-service teachers' attitudes towards overseas professional experience: Implications for professional practice. *Australian Journal of Teacher Education, 38*(12). doi: 10.14221/ajte.2013v38n12.5

Cochran-Smith, M. (2001). Multicultural education: Solution or problem for American schools? *Journal of Teacher Education, 52*(2), 91-93. doi: 10.1177/0022487101052002001

Cruickshank, K., & Westbrook, R. (2013). Local and global - conflicting perspectives? The place of overseas practicum in preservice teacher education. *Asia-Pacific Journal of Teacher Education, 41*(1), 55-68. doi: 10.1080/1359866X.2012.753989

DeVillar, R. A., & Jiang, B. (2012). From student teaching abroad to teaching in the U.S. classroom: Effects of global experiences on local instructional practice. *Teacher Education Quarterly, 39*(3), 7-24.

Duncan-Andrade, J. M. (2009). Note to educators: Hope required when growing roses in concrete. *Harvard Educational Review, 79*(2), 181–94.

Echevarria, J., Vogt, M. E., & Short, D. (2008). *Making content comprehensible for English Language Learners: The SIOP® Model, Third Edition*. Boston, MA: Allyn & Bacon.

Gay, G. (1993) Building cultural bridges: A bold proposal for teacher education. In J. Adams & J. Welsch (Eds.) *Multicultural education: Strategies for implementation in colleges and universities, Volume 4* (pp. 94-106). Macomb, IL; Western Illinois University.

Glazier, J. (2003). Developing cultural fluency: Arab and Jewish students engaging in each other's company. *Harvard Educational Review, 73*(2), 141-163.

Harbon, L. (2007). Short-term international experiences and teacher language awareness. *International Education Journal, 8*(1), 229-243.

Kambutu, J., & Nganga, L. W. (2008). In these uncertain times: Educators build cultural awareness through planned international experiences. *Teaching and Teacher Education, 24,* 939-951. doi: 10.1016/j.tate.2007.08.008

Klinger, J., Artiles, A., Kozleski, E., Harry, B., Zion, S., Tate, W., Duran, G., & Riley, D. (2005) Addressing the disproportionate representation of culturally and linguistically diverse students in special education through culturally responsive educational systems. *Education Policy Analysis Archives, 13*(38), 1-43. Retrieved from http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ846743

Landerholm, E., & Chacko, J. B. (2013). *Student teaching abroad: An experience for 21st century teachers.* Washington, DC: ERIC - Institute of Education Sciences. Retrieved from http://files.eric.ed.gov/fulltext/ED540609.pdf

Lee, J. F. K. (2009). ESL student teachers' perceptions of a short-term overseas immersion programme. *Teaching and Teacher Education, 25,* 1095-1104. doi: 10.1016/j.tate.2009.03.004

Lu, H., & Soares, L. (2013). US elementary preservice teachers' experiences while teaching students in Taiwan. *Journal of the Scholarship of Teaching and Learning, 14*(1), 59-74. doi: 10.14434/josotl.v14i1.4170

Mahon, J. (2007). A field of dreams? Overseas student teaching as a catalyst towards internationalizing teacher education. *Teacher Education Quarterly, 34*(1), 133-149.

Mahon, J., & Cushner, K. (2002). Overseas student teaching: Affecting personal, professional, and global competencies in an age of globalization. *Journal of Studies in International Education, 6*(1), 44-59. doi: 10.1177/1028315302006001004

Malewski, E., & Phillion, J. (2009). International field experiences: The impact of class, gender and race on the perceptions and experiences of preservice teachers. *Teaching and Teacher Education, 25,* 52-60. doi: 10.1016/j.tate.2008.06.007

Malewski, E., Sharma, S., & Phillion, J. (2012). How international field experiences promote cross-cultural awareness in preservice teachers through experiential learning: Findings from a six-year collective case study. *Teachers College Record, 114,* 1-44.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Jossey-Bass.

Merryfield, M. M. (2000). Why aren't teachers being prepared to teach for diversity, equity, and global connectedness? A study of lived experiences in the making of multicultural and global educators. *Teaching and Teacher Education, 16,* 429-443. doi: 10.1016/S0742-051X(00)00004-4

National Center for Education Statistics (2013). *English language learners.* Retrieved from https://nces.ed.gov/programs/coe/indicator_cgf.asp

National Council of Teachers of English (2011). Supporting linguistically and culturally diverse learners in English education. Retrieved September 27, 2012 from: http://www.ncte.org/

Oberg, K. (1960). Culture shock: Adjustment to new cultural environments. *Practical Anthropology, 7*, 177-182.

Osterman, K. F., & Kottkamp, R. B. (2004). *Reflective practice for educators: Professional development to improve student learning (2nd ed.).* Thousand Oaks, CA US: Corwin Press.

Quezada, R. L. (2004). Beyond educational tourism: Lessons learned while student teaching abroad. *International Education Journal, 5*(4), 2004.

Sharma, S., Rahatzad, J., & Phillion, J. (2013). How preservice teachers engage in the process of (de)colonization: Findings from an international field experience in Honduras. *Interchange, 43,* 363-377. doi: 10.1007/s10780-013-9182-2

Trent, S., Kea, C., & Oh, K. (2008). Preparing pre-service educators for cultural diversity: How far we have come? *Exceptional Children, 74*(3), 328-350.

United States Department of Education, National Center for Educational Statistics. (2012). *The condition of education 2012*, (NCES Publication No. 2012-045). Washington, DC: U.S. Government Printing Office. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012045

Zhao, Y., Meyers, L, & Meyers, B. (2009). Cross-cultural immersion in China: Preparing pre-service elementary teachers to work with diverse student populations in the United States. *Asia-Pacific Journal of Teacher Education, 37*(3), 295-317. doi: 10.1080/13598660903058925

Locus of control, academic self-concept, and academic dishonesty among high ability college students

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Abstract: The purposes of the current study were to evaluate a measure of academic dishonesty and examine high ability college students' loci of control and its effect on behaviors of academic dishonesty, as moderated by academic self-concept. A total of 357 high ability college students enrolled at two universities in the southwestern United States took part in this study. Variables and the moderation of academic self-concept were examined for the aggregate group (n = 357) and for the disaggregate honors and non-honors groups. Students completed the Rotter Internal-External Locus of Control Scale (Rotter, 1966), the Self-Description Questionnaire III (Marsh, 1989), and a scale to measure academic dishonesty based on the work of Geddes (2011). A 17-item measure of academic dishonesty was developed. Results indicate locus of control does not significantly predict academic dishonesty for the non-honors group, but several relationships were found among variables for the aggregate group and for the honors and non-honors groups.

Keywords: locus of control, academic self-concept, academic dishonesty, gifted college students

Many researchers have studied locus of control, or a person's belief about how much control he or she has over events in his or her life (Lefcourt, 1966; Rotter, 1966). Starting several decades ago, researchers began applying the concept of locus of control to the academic setting (for reviews, see Findley & Cooper, 1983; Kirkpatrick, Stant, Downes, & Gaither, 2008; Mehta, 2009; Prihadi & Hairul, 2011). This research has generally indicated that an individual's locus of control leads to different reactions in various situations, including academic settings (Keith, Pottebaum, & Eberhardt, 1986). Little research, though, has examined the role of locus of control among high ability students (Assouline, Colangelo, Ihrig, & Forstadt, 2006; Siegle, Rubenstein, Pollard, & Romey, 2010). Because having an internal locus of control and academic success (e.g., learning, high grades) are related (Keith et al., 1986), more research is needed to examine the loci of control of high ability and academically successful (or unsuccessful) students.

Little to no research exists regarding the relationship between locus of control and academic dishonesty, or cheating, among high ability students (see Geddes, 2011). A relationship between locus of control and academic dishonesty has been found among average ability samples, though, whereby those with an external locus of control are more likely to engage in academic dishonesty than those with an internal locus of control (Gallagher, 2010; Karabenik & Srull, 1978; Pino & Smith, 2003; Rettinger & Kramer, 2009). Other variables may influence the relationship between locus of control and academic dishonesty, too, such as personal expertise, anticipated elation, and anticipated regret (Sierra & Hyman, 2006). Among high ability samples in particular, academic self-concept, or one's feelings about his or her own academic abilities

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(Marsh & Shavelson, 1985), may influence the relationship between locus of control and academic dishonesty. These achievement-related beliefs, namely locus of control and academic self-concept, affect academic outcomes, including academic dishonesty.

Research generally indicates an external locus of control is negatively related to self-esteem (Benson et al., 1994; Downs & Rose, 1991; Smith, Sapp, Farrell, & Johnson, 1998), and, in an academic setting, an internal locus of control is related to a higher academic self-concept (Anazonwu, 1995; Gadzella, Williamson, & Ginther, 1985). In other words, those who take ownership of their successes and failures have stronger feelings about their own academic abilities. Further, research indicates that those with a higher academic self-concept are less likely to engage in academic dishonesty (Murdock & Anderman, 2006). Thus, because high ability students typically have higher academic self-concepts and a more internal locus of control than average ability students (Litster & Roberts, 2011; Siegle & Reis, 1998), they may be less likely to engage in academic dishonesty. Therefore, the purpose of this study is to evaluate a measure of academic dishonesty for use with high ability college students and to explore the relationship between achievement-related beliefs, namely locus of control and academic self-concept, and academic dishonesty among high ability college students.

Locus of Control

Locus of control stems from social learning theory (Rotter, 1954) and Weiner's (1974, 1985) attribution theory, and refers to a person's perception about the underlying root causes of successes or failures in his or her life (Heider, 1958; Lefcourt, 1966; Rotter, 1966; 1975; Weiner, 1974). When individuals most often believe their successes and failures are due to factors within their control, they are viewed as having an internal locus of control (i.e., success or failure happened because of effort the individual put forward or did not put forward). If individuals most often believe their successes and failures are due to something outside of their control (i.e., success or failure happened because of luck or task difficulty), they are regarded as having an external locus of control. For extensive reviews of the literature on locus of control and attribution theory, see Assouline et al. (2006), Carton and Nowicki (1994), Findley and Cooper (1983), and Lefcourt (1982).

Attribution interpretations can lead to both positive and negative reactions. For example, if an individual interprets a failure as the result of too little effort (an internal locus of control), he or she likely believes that increased effort will make a positive change in the outcome. Those with an internal locus of control are more likely to strive for achievement, work to improve their situation, apply what they learn toward positive outcomes for the future, and persist in the face of failure (Findley & Cooper, 1983). Conversely, if an individual interprets a failure as the result of a difficult exam or an unfair instructor (an external locus of control), he or she may believe that his or her performance is due to factors beyond his or her control and may not see any reason to hope for future improvements.

While there are advantages and disadvantages to having an internal or external locus of control in different settings, many psychologists and researchers agree that having an internal locus of control is ultimately the healthier attribute (Crandall & Crandall, 1983). Studies conducted with college students indicate those students with an internal locus of control show more success in adjustment to college life than those with an external locus of control (Martin & Dixon, 1994), those students with an internal locus of control had above average college course grades (Kirkpatrick et al., 2008), and an internal locus of control generally predicts greater

academic success overall (Carden, Bryant, & Moss, 2004; Keith et al., 1986). Further, when college students move from an external to an internal locus of control their grades tend to improve (Noel, Forsyth, & Kelley, 1987),

Locus of control and high ability students. Most research indicates high ability and gifted students have an internal locus of control (Assouline et al., 2006; Collier, Jacobson & Stahl, 1987; Harty, Adkins, & Hungate, 1984; Heller & Ziegler, 1996; Laffoon, Jenkins-Friedman, & Tollefson, 1989; Morrow, 1989; Siegle & Reis, 1998; Siegle et al., 2010; Yong, 1994), with locus of control becoming more internal through the school years and beyond (Karnes & D'Ilio, 1991; Kormanik & Rocco, 2009). Laffoon et al. (1989) indicate high achieving gifted students had a significantly higher internal locus of control than both underachieving gifted and non-gifted students. Similarly, research has shown that high achievers have higher internal locus of control scores than underachievers (Kanoy, Johnson, & Kanoy, 1980; Knight, 1995). An external locus of control may be associated with classroom stress and classroom burnout (Fimian & Cross, 1986), which could also lead to underachievement.

Chan (1996) found that high ability students often perceive themselves to be cognitively competent and therefore are less likely to attribute failures to a lack of ability than their average-achieving peers. Further, high ability students had more confidence in their own personal control over successes and failures in their school coursework than their average ability peers. In other words, gifted students tended to believe they have more control over their coursework due to the fact that they could control the learning strategies they used and the amount of effort they put in to their work.

Within the gifted population, level of ability may play a role in individual locus of control. In a study of highly, moderately, and mildly mathematically gifted Finnish adolescents and adults, Nokelainen, Tirri, and Merenti-Välimäki (2007) found that highly and moderately mathematically gifted individuals believe ability is more important for success than effort, while mildly mathematically gifted individuals believe effort is more important for success. In addition, moderately and mildly mathematically gifted individuals believe a lack of effort causes failure, while highly mathematically gifted individuals believe a lack of ability causes failure.

Locus of control and academic dishonesty. Engaging in academic dishonesty, or the deliberate use of someone else's information in work submitted for academic credit (Pavela, 1997), likely depends somewhat on one's locus of control (Sierra & Hyman, 2006). Believing that successes or failures are out of one's control may result in academic dishonesty. "Cheaters tend to consider their behavior acceptable when they can describe it as caused by external forces rather than their own dishonesty" (Rettinger & Kramer, 2009, p. 295). For example, believing that an exam will be so difficult that it is impossible to pass may lead some students to engage in academically dishonest behavior (i.e., cheating rather than studying).

Some researchers have found significant results regarding the relationship between academic dishonesty and an external locus of control (Gallagher, 2010; Karabenick & Srull, 1978; Lefcourt, 1982; Pino & Smith, 2003). Alarape and Onakoya (2003) examined the cheating behaviors and personality variables, including locus of control, of Nigerian college students. They report that students with an external locus of control reported more cheating behaviors. In addition to actual behavior, locus of control affects attitudes toward cheating and unethical behavior in the classroom. Trevino and Youngblood (1990) found American graduate students who had an internal locus of control were less likely to engage in unethical behavior. In a study of American undergraduates, Coleman and Mahaffey (2000) found similar results: those with an external locus of control viewed cheating as more acceptable than those with an internal locus of

control. On the contrary, Whitley (1998), in his meta-analysis of academic dishonesty among college students, found cheating was slightly correlated with an internal locus of control. Further examination by Whitley revealed "students with an internal control are more likely to cheat on a task when they think the outcome is based on skill rather than chance, and the opposite is true of those with an external locus of control" (p. 251).

Academic Dishonesty

Academic dishonesty among college students has reached epidemic proportions (Arvidson, 2004; McCabe, Trevino, & Butterfield, 2001). In fact, according to the Center for Academic Integrity (2007), approximately 85% of students surveyed admitted to cheating at least once. Similarly, a national survey published in *Education Week* showed that 54% of students admitted to plagiarizing from the internet, 74% of students admitted to a serious cheating offense at least once during the last school year, and 47% of students believe their teachers sometimes choose to ignore when they saw students cheat (What is plagiarism?, n.d.). Research also indicates some specific forms of cheating have increased over the last several decades (Vandehey, Diekhoff, & LaBeff, 2007), particularly those that involve technology and the Internet (Jones, 2011). Many students even feel justified in cheating under certain circumstances, such as when students do not believe their cheating will affect others (LaBeff, Clark, Haines, & Diekhoff, 1990).

Academic dishonesty impedes learning (Gardner & Melvin, 1988) and compromises the assessment of student learning (West, Ravenscroft, & Shrader, 2004), such that educators cannot adequately assess student learning if no learning has occurred. Further, academic dishonesty is a high-risk behavior for college students because being caught cheating can have devastating effects, including probation, suspension, or expulsion from school.

What would lead someone to cheat if the consequences are so great? Rettinger and Kramer (2009) separated the reasons for cheating into three categories; 1) student motivation (intrinsic or extrinsic), 2) neutralizing attitudes (e.g., "no one else is hurt if I cheat", p. 299), and 3) perceptions that others were cheating. Owunwanne, Rustagi, and Dada (2010) suggest the following reasons for cheating also play an important part in the causes of academic dishonesty: "pressure from peers, lack of preparedness, unrealistic expectations and the emphasis on success … emphasis on higher grades for impressive transcripts, scholarship opportunities and possible Graduate Assistantships" (p. 61). The reasons for academic dishonesty are varied and extensive, suggesting more research is needed to understand precursors to this behavior.

Academic dishonesty and high ability students. Few research studies have been published on academic dishonesty and high ability students (Abilock, 2009), perhaps because higher academic achievement and stronger beliefs in one's abilities (academic self-concept) are consistently related to lower levels of academic dishonesty (Haines, Diekhoff, LaBeff, & Clark, 1986; McCabe & Trevino, 1997; Whitley, 1998). In fact, research indicates there is a significant negative relationship between grade point average and academic dishonesty (Antion & Michael, 1983; Crown & Spiller, 1998; Singhal, 1982). And, research on college students shows less able students are more likely to cheat than more able students (Newstead, Franklyn-Stokes, & Armstead, 1996).

Yet, because of the vast numbers of college students who admit to behaviors of academic dishonesty, it is logical to assume that some high ability college students are also engaging in academic dishonesty, particularly given the emphasis on academic performance within this

population (Abilock, 2009). Research on high ability students and academic dishonesty has shown that these students' motivation to cheat was attributed to grades and grade point average pressure, peer pressure, and the demands of a heavy workload (Geddes, 2011).

Academic Self-Concept

Self-concept can be defined as "a person's perceptions of him- or herself … formed through experience with and interpretations of one's environment" (Marsh & Shavelson, 1985, p. 107). Self-concept is both multifaceted "in that people categorize the vast amount of information they have about themselves and relate these categories to one another", and is hierarchically arranged "with perceptions of behavior at the base moving to inferences about self in sub areas (e.g., academic-English, science, history, mathematics), then to inferences about self in general" (Marsh & Shavelson, p. 107; Shavelson, Hubner, & Stanton, 1976). Academic self-concept can be defined as a person's perceptions about him- or herself related to his or her academic abilities.

A student's academic self-concept is especially important to his or her success in school and this is particularly true when it comes to high ability students (Rinn, Plucker, & Stocking, 2010). For example, Lent, Brown, and Gore (1997) found that academic self-concept was a significant predictor of students' academic achievement (i.e., grade point average) in college. The academic self-concepts of high ability college students also likely affect such areas as educational aspirations, career aspirations, and retention, in addition to academic achievement (Rinn, 2005; 2007).

Academic self-concept and high ability students. Gifted and high ability students usually differ from average ability students with respect to their self-concepts, particularly in the area of academic self-concept (Pyryt & Mendaglio, 1994). Relative to average-ability students, gifted students typically have higher academic self-concepts (Ablard, 1997; Colangelo, Kelly, & Schrepfer, 1987; Litster & Roberts, 2011). Research has shown that honors college students have considerable confidence in their academic abilities (Mathiasen, 1985). Further, research indicates high ability college students enrolled in an honors program have higher academic self-concepts than their equally able peers who are not enrolled in an honors program (Rinn, 2007).

Relationship between Locus of Control, Academic Self-Concept, and Academic Dishonesty

Achievement-related beliefs, such as locus of control and academic self-concept, are likely to influence one's decision to engage in academic dishonesty. Attributions for success or failure, whether they be internal or external, are one piece of information that students use to make appraisals regarding their academic abilities and to form their academic self-concepts (Marsh, 1986; Pyryt & Mendaglio, 1994; Schunk, 1991; Siegle et al., 2010). Belief in one's academic ability (academic self-concept) may cause a student to believe they have the ability be successful, which could deter that student from academically dishonest behavior (Murdock & Anderman, 2006).

The Current Study

The current study assesses a measure of academic dishonesty and also examines high ability college students' loci of control and its relationship to behaviors of academic dishonesty, as moderated by academic self-concept. The researchers examine a sample of 357 high ability

students from two universities, and two subsamples, honors students and non-honors students (see Table 1). Membership in an honors program has potentially greater consequences for academic dishonesty (e.g., being kicked out of the program, losing scholarships). Because those

Table 1
Descriptive Statistics for Participants

Variable	Whole-Group (n=357)	University A (n=137)	University B (n=220)	Honors (n=179)	Non-honors (n=178)
Mean age (yrs.)	19.87	19.84	19.73	19.62	20.05
Gender					
Male	32.3%	35.5%	28.5%	37.4%	28.1%
Female	63.3%	61.0%	69.3%	57.5%	70.8%
transgender	0.5%	0.0%	1.5%	0.6%	0.6%
Non-responders	2.1%	3.6%	.7%	4.5%	0.6%
Ethnicity					
Caucasian	74.2%	73.7%	77.9%	73.7%	77.5%
Biracial/Multiracial	7.9%	6.6%	8.6%	6.7%	8.4%
Hispanic	7.5%	6.6%	7.7%	6.1%	8.4%
Asian	5.7%	7.3%	4.1%	6.7%	3.9%
African American	1.9%	4.4%	.9%	4.5%	0.0%
American Indian/Alaska Native	0.3%	0.7%	0.0%	0.6%	0.0%
Native Hawaiian or other Pacific Islander	0.3%	0.0%	.5%	0.0%	0.6%
Non-responders	2.7%	0.7%	1.4%	1.1%	1.1%

high ability students who chose to apply for membership to an honors program might have higher academic self-concepts than equally able students who do not choose to apply for membership to an honors program (Rinn, 2007), membership in an honors program might affect the relationship between locus of control and academic dishonesty among equally able college students. Gaining a more complete understanding of high ability college students' achievement-related beliefs (academic self-concepts and loci of control) could enhance academic dishonesty research (Arvidson, 2004), inform policy regarding academic dishonesty on university campuses, and provide information to academic advisors and professors who work with high ability college students, whether they are enrolled in an honors program or not.

Method

Participants

Participants for the current study include high ability college students from two universities in the southwestern United States. University A is a public, research university with an enrollment of about 28,325 undergraduates and 7,429 graduate students. University B is a private, religious, co-educational, liberal arts university with an enrollment of about 1,337

undergraduate students and 1,506 graduate students. An e-mail was sent to all honors students at University A (*n* = 1,100) and at University B (*n* = 1,112) that invited them to participate in an online research study regarding college student experiences. These students had SAT scores above 1200 or ACT scores above 27. Both universities have honors programs, but not all high ability students enrolled in honors classes participate in the honors programs, resulting in a sample of both honors and non-honors students. The participants who responded resulted in a convenience sample. Participants were asked to electronically sign an informed consent document and then complete a series of online questionnaires.

Students designated to the "honors" group were members of an honors program and had a combined SAT score of 1200 or greater (old version) or 1800 or greater (new version), or an ACT score of 27 or greater. The honors group is comprised of students from both universities. Students who were designated to the "non-honors" group were not members of an honors program, but had a combined SAT score of 1200 or greater (old version) or 1800 or greater (new version), or an ACT score of 27 or greater. The researchers chose 1200/1800 as a cut-off score to indicate high-ability because this is the minimum requirement for acceptance into the honors program at University A.

A total of 421 high ability college students across the two universities returned the survey, whereby 153 were from University A and 268 were from University B. *T*-tests showed no significant differences between the participants from the two universities with regard to the mean scores of locus of control, academic self-concept, and academic dishonesty.

Missing data. Missing data in longitudinal social science research is not uncommon (Juster & Smith, 1997). In particular, college students are responding at lower rates than in previous decades (Dey, 1997). In the current study, a total of 64 cases within the three variables (i.e., locus of control, academic self-concept, and academic dishonesty) were missing substantial portions of the scale data. List-wise deletion was used to remove those 64 cases from the study. The data set from the remaining 357 participants still had some missing data points scattered throughout. Therefore, the expectation maximization (EM) algorithm via the Statistical Package for the Social Sciences (SPSS) 17.0 Missing Values Analysis (MVA) was used to further examine the missing data. The results of the test for missingness revealed the missing data were missing completely at random (MCAR) (*p* = .45). Multiple data imputation (MI) for data MCAR (Peugh & Enders, 2004) was used to generate models with imputed values for the missing data. The imputed values were produced using full information maximum likelihood (FIML) estimation (Dempster, Laird, & Rubin, 1977; Enders & Bandalos, 2001) by means of the EM algorithm. Using MI to replace missing data retains the sample size, maintains statistical power, and preserves variance in the data set (Peugh & Enders).

In the final data set, 179 students were in the honors group and 178 students were in the non-honors group. The disaggregate honors and non-honors groups of participants together comprise the aggregate group of participants (n = 357). Age, gender, and ethnicity data for the participants is presented in Table 1. The mean age of the participants in this study is approximately 19 years 11 months. There were more female participants than male participants in all groups. In addition, approximately three-fourths of the participants in all groups identify themselves as Caucasian. Standardized test scores were examined by whole group, and by honors membership (see Table 2).

Table 2

Descriptive Statistics for ACT/SAT Test Scores

	Whole-Group			Honors			Non-Honors		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
ACT	146	30.53	2.60	68	30.44	2.64	78	30.93	2.33
SAT (old version)	159	1388.13	142.70	60	1435.70	185.90	99	1359.29	98.99
SAT (new version)	52	2028.63	155.41	51	2029.60	156.83	1	1980.00	

Measurement Instruments

Locus of control. Locus of control was measured using Rotter's Internal-External Locus of Control Scale (I-E Scale; Rotter, 1966). The I-E Scale consists of 23 forced choice items and six filler items, which were designed to make the questionnaire more ambiguous to respondents. The 23 forced choice items measure beliefs about "the nature of the world" and each item is comprised of an internal statement paired with an external statement (Rotter, p. 10). Scores range from 0 (most external) to 23 (most internal). Sample items include, "Many of the unhappy things in people's lives are partly due to bad luck versus People's misfortunes result from the mistakes they make" and "The average citizen can have an influence in government decisions versus This world is run by the few people in power, and there is not much the little guy can do about it." In a meta-analysis of studies using the I-E Scale, Beretvas, Suizzo, Durham, and Yarnell (2008) found an internal consistency mean of .66 and a median of .69. Cronbach alpha for the current administration of the I-E Scale is .74.

Academic self-concept. Academic self-concept was measured using the academic self-concept subscale of The Self-Description Questionnaire III (SDQ-III; Marsh, 1989). The SDQ-III is based on the Shavelson model of self-concept, which supports the notion that self-concept is both multifaceted and hierarchical (Shavelson et al., 1976).

The SDQ-III contains 136 items and measures 13 facets of self-concept (Marsh & O'Neill, 1984). Each facet is measured by 10 to 12 items, whereby responses range from 1 (definitely false) to 8 (definitely true). Half of the items are negatively worded (Marsh, 1989). The SDQ-III assesses four areas of academic self-concept (math, verbal, academic, and problem solving), eight areas of nonacademic self-concept (physical ability, physical appearance, relations with the same sex, relations with the opposite sex, relations with parents, spiritual values/religion, honesty/trustworthiness, and emotional stability), and general self-concept. Marsh (1989) provides strong psychometric support for the SDQ-III, including scores of reliability, correlations with external criteria, and self-other agreement. Historically, cores of internal consistency range from $\alpha = 0.74$ to $\alpha = 0.95$ for the subscales of the SDQ-III. Cronbach alpha for the administration of the academic self-concept subscale of the SDQ-III with the present population is .87.

For the purposes of this study, the general academic subscale of the SDQ-III was used to measure academic self-concept. The meaning of the academic subscale, as defined by Marsh

(1989), is "I am a good student in most school subjects." The academic subscale contains 10 items including, "I enjoy doing work for most academic subjects" and "I have trouble with most academic subjects" (p. 12). Reliability scores for the academic subscale of the SDQ-III range from 0.86 to 0.92 (Marsh & Byrne, 1993). See Rinn and Cunningham (2008) for further validity and reliability evidence for the academic self-concept subscale for use with high ability college students. Factor analysis indicates factor loadings range from 0.47 to 0.81 on the academic subscale (Marsh, 1989). Factors correlated with the academic self-concept subscale range from 0.06 (physical ability subscale and opposite sex relationships subscale) to 0.33 (math subscale). Overall, the factor structure of the SDQ-III is consistent with the hypothesized hierarchical model of self-concept originally proposed by Shavelson et al. (1976).

Academic dishonesty. Academic dishonesty was measured using an adaptation of the work by Geddes (2011). Geddes created a questionnaire designed to measure motivations for cheating and cheating behaviors/rates of occurrence that was used to examine the academic dishonesty behaviors of gifted high school students. Geddes created the questionnaire based on a review of the literature and a survey of students' and colleagues' experiences.

The portion of the questionnaire that measures cheating behaviors lists 13 specific behaviors and asks students to identify the number of times they had engaged in that behavior. The answer range for the cheating behaviors portion of the questionnaire is "never" to "more than five times." From the data collected in this scale Geddes (2011) reported the percent of participants who indicated they had engaged in the behavior.

The second portion of the questionnaire used by Geddes (2011) includes a broader range of reasons/motivations for academic dishonesty. This portion of the questionnaire included three categories regarding one's intention to engage in academic dishonesty: academic reasons, nonacademic reasons, and neutralizing attitudes. The questionnaire requires students to consider 31 possible motivations for academic dishonesty and to rate each from "strongly disagree" to "strongly agree" on each item being a motivation for cheating. Geddes then reported the percent of students in agreement for each item.

The current study requires a scale that results in a report of actual incidence of cheating so that the relationships between locus of control, academic self-concept, and academic dishonesty can be examined. By modifying the portion of the questionnaire designed to measure motivation for academic dishonesty used by Geddes (2011), researchers were able to ask students if they had engaged in academic dishonesty and ascertain student motivation for the engagement. Students were asked to provide the rate at which they had engaged in academic dishonesty because of the motivation listed. The rate for the scale is "never" to "five or more times." A rate closer to the zero end of the scale indicates less incidence of academic dishonesty due to the corresponding motivation. Researchers also believed that students might be more willing to respond to reasons for engaging in academically dishonest behaviors than providing information on specific rates and types of academically dishonest behavior.

Of the 31 items used by Geddes (2011), 24 were chosen. Researchers chose the items most relevant for a university sample, combined some of the items, and reworded items so that they were specific to a university sample. The result was a 20-item scale that asked students to rate the number of times they engaged in academic dishonesty for each motivation (see Appendix A). Factor analysis was conducted to examine the factor structure of the revised scale. Where Geddes (2011) used the questions on motivation for cheating as a single questionnaire that asked questions related to academic, non-academic, and neutralizing reasons for cheating, our data revealed a two factor structure for the newly adapted *Motivation for Academic*

Dishonesty scale used in the current study. Details for the factor analysis are presented in the results section.

Procedure

An e-mail was sent to students at both universities that invited them to participate in an online research study regarding college student experiences. The participants who responded resulted in a convenience sample. Participants were asked to electronically sign an informed consent document and then complete a series of online questionnaires. When coding the participants in the data file, honors participants were coded as 1 and non-honors participants were coded as 2. Statistical Package for the Social Sciences (SPSS) was used to examine the variables and the interaction of locus of control and academic dishonesty.

Results

To explore the relationship between locus of control (LOC) and academic dishonesty (AD) as moderated by academic self-concept (ASC), researchers modified a portion of the Geddes (2011) questionnaire designed to measure academic dishonesty and conducted a principal factor analysis to examine the construction of the newly developed *Motivation for Academic Dishonesty* scale. Once the factor analysis of the *Motivation for Academic Dishonesty* scale was complete, a multiple regression analysis was conducted with academic dishonesty as the dependent variable, locus of control and academic self-concept as the independent variables, and LOC x ASC as a moderator variable. In addition, the relationship between locus of control and academic dishonesty, as moderated by academic self-concept was examined by aggregate and disaggregate groupings (honors vs. non-honors).

Factor Analysis of the *Motivation for Academic Dishonesty* Scale

Geddes (2011) did not report a factor analysis on her questionnaire designed to measure academic dishonesty among high ability students. However, Geddes grouped the items in the portion of the questionnaire that was designed to measure motivations for cheating into three categories: academic reasons, non-academic reasons, and neutralizing attitudes. In the current study, the researchers chose 24 items from the Geddes questionnaire that were most relevant for a university sample. Once the questionnaire items were chosen, modifications to those items were made to create a 20-item scale relevant for a university population. Factor analysis was then conducted to determine if the factor structure of the modified scale was similar to the three divisions Geddes used.

The initial step in the factor analysis for the 20-item *Motivation for Academic Dishonesty* scale was the consideration of factorability. Four criteria were used to determine the factorability of the correlation of scale items for the current study: item correlation, Kaiser-Meyer-Olkin measure of sampling adequacy, Bartlett's test of sphericity, and communality values. First, item correlation greater than 0.3 with at least one other item was achieved indicating reasonable factorability. Next, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.91, well above the recommended value of 0.5 (Tabachnick & Fidell, 2007). The Bartlett's test of sphericity was significant (χ^2 [190] = 5677.50, $p < .01$). Lastly, all communality values, except one, were above 0.3 (see Table 3) indicating that the items shared common variance with other items. With

Table 3

Communalities - Individual Motivation for Academic Dishonesty Scale

Scale Items	Communalities			
	20 Item		17 Item	
	Initial	Extracted	Initial	Extracted
Unfair teacher	.83	.83	.80	.81
Teacher did not adequately explain material	.73	.78	.76	.76
School workload too heavy	.70	.68	.64	.63
Teachers' demands are unreasonable	.71	.69	.69	.68
Overly harsh grading	.74	.73	.67	.68
Illness prevents adequate preparation	.58	.57	.43	.44
Too many tests on one day	.74	.73	.71	.71
Easier than studying	.72	.66	.62	.60
The material is not important	.67	.66	.55	.53
Others' cheating puts you at a disadvantage	.49	.22	.22	.21
Others cheat	.66	.53		
Driven by high GPA	.51	.32		
More competitive for graduate school or professional school admission	.73	.72	.72	.74
Feeling of pressure from parents	.70	.70	.70	.72
To maintain eligibility for a scholarship	.69	.65	.59	.56
Need to excel at any cost	.63	.61	.59	.57
To maintain eligibility for athletic qualification	.72	.68	.54	.57
Didn't have the ability to do well in the class without cheating	.69	.60	.47	.47
Job leaves no time for studying	.70	.69	.64	.65
Lack of effort/ did not study or attend class	.63		.49	

consideration of these indicators, it was determined that the set of scale items were factorable. The factor analysis was continued using all 20 items.

Principal factor analysis, with direct oblimin rotation, and maximum likelihood extraction, was conducted on the *Motivation for Academic Dishonesty* scale, for the aggregate group of 357 high ability college students. A parallel analysis (Horn, 1965), also referred to as an eigenvalue Monte Carlo simulation, was conducted to determine the number of factors to extract in the analysis. A raw data permutation approach to data generation for the Monte Carlo simulation was used. A comparison of the permutated data at the 95th percentile for each component, to the raw data for each component, showed the 3rd factor permutated data to be greater than the raw data. This result indicates the permutated data ceased to be significant at the

third component, revealing a two factor structure for the *Motivation for Academic Dishonesty* scale (see Table 4). Once the number of factors to extract had been determined for the aggregate

Table 4

Eigenvalue Monte Carlo Simulation

	Composite Group	
Root	Raw Data	Raw Data Permutation 95th percentile
1	9.35	1.53
2	1.72	1.39
3	.94	1.30
	Honors	
1	10.67	1.91
2	2.59	1.63
3	1.11	1.47
	Non-Honors	
1	8.61	1.76
2	1.70	1.57
3	1.03	1.44

group, the same Monte Carlo simulation was conducted for the disaggregate honors and non-honors groups to determine if the number of factors was the same in the disaggregate groups. When the permutated data, at the 95th percentile, were compared to the raw data, the permutated data ceased being significant after the second component indicating a two factor structure for the disaggregate groups as well (see Table 4).

Once the factorability and the number of factors to extract were determined, the factor analysis continued with an examination of factor loadings (see Table 5). The two factors accounted for 58.28% of the total variance. However, three items in the *Motivation for Academic Dishonesty* scale had low initial loadings and cross loaded on the second factor. Those three items, "others cheat," "driven by high GPA," and "lack of effort/did not study or attend class," were removed from the scale and a second factor analysis was conducted with the remaining 17 items.

In the 17-item *Motivation for Academic Dishonesty* scale, the Kaiser-Meyer-Olkin measure of sampling adequacy changed to 0.92, the Bartlett's test of sphericity was significant (χ^2 [136] = 4829.77, $p < .01$) and all but one communality values were above 0.3 (see Table 3). In the 17 item scale, the overall variance accounted for rose to 60.73%, with the first factor explaining 52.78% of the total variance and the second factor explaining an additional 7.95% of the total variance. Clear loadings were established in the 17-item scale (see Table 5).

The two factor structure determined in this analysis is different than the three groupings that Geddes (2011) created. In the current study, the two factors are interpreted as internal and external forces that create motivation to engage in academic dishonesty. Internal consistency for each factor was examined using Crohbach's alpha. Alpha values for the two factors were good, with factor 1 (imposition of external influences, such as overly harsh grading and poor instruction) alpha being .92, and alpha for factor 2 (imposition of internal influences, such as perceived ability level and drive to succeed) being .86.

Table 5

Factor Loadings - Individual Motivation for Academic Dishonesty Scale

Scale Items	Factor Loadings			
	20 Item		17 Item	
	External	Internal	External	Internal
Unfair teacher	.94		.94	
Teacher did not adequately explain material	.94		.93	
School workload too heavy	.82		.81	
Teachers' demands are unreasonable	.80		.79	
Overly harsh grading	.76		.74	
Illness prevents adequate preparation	.69		.69	
Too many tests on one day	.67		.67	
Easier than studying	.60		.59	
The material is not important	.58		.57	
Others' cheating puts you at a disadvantage	.50		.49	
Others cheat why shouldn't I	.48	.31		
Driven by high GPA	.33	.29		
More competitive for graduate school or professional school admission		.90		.91
Feeling of pressure from parents		.87		.88
To maintain eligibility for a scholarship		.80		.77
Need to excel at any cost		.75		.72
To maintain eligibility for athletic qualification		.66		.69
Didn't have the ability to do well in the class without cheating		.54		.54
Job leaves no time for studying		.52		.53
Lack of effort/ did not study or attend class	.37	.39		

Moderation Analysis

The moderation analysis in the current study used the newly established 17-item *Motivation for Academic Dishonesty* scale. Descriptive statistics for the variables of interest, locus of control (LOC), Academic Self-Concept (ASC), and Motivation for Academic Dishonesty (MAD), are presented in Table 6.

Correlation. The first step in the moderation analysis is to determine if the independent variables (locus of control and academic self-concept) are correlated with the dependent variable (academic dishonesty, 17-item scale). A Pearson product moment correlation (Pearson, 1895) was used to determine correlated variables for the aggregate group and each disaggregate group (see Table 7). In the current study, locus of control is not statistically significantly correlated with academic dishonesty in the whole-group, nor in the honors group. Without correlation between the independent and dependent variables, further moderation analysis was not able to be conducted with these two groups. There was a small, yet significant, correlation between locus of control and academic dishonesty (r[176] = -0.21, $p < .001$), as well as between academic self-concept and academic dishonesty (r[176] = -0.29, $p < .001$) for the non-honors group and further analysis was conducted for the non-honors group.

Regression. Without correlation of locus of control with academic dishonesty in the composite group or the honors group, regression moderation analysis was not completed for those groups. Correlation results in the non-honors group showed a small yet significant correlation between locus of control and the external motivation for academic dishonesty factor. A multiple regression using the enter method was conducted between external motivation for academic dishonesty factor as the dependent variable, and locus of control (LOC), academic self-concept (ASC), and the moderator variable (LOC X ASC) as the independent variables. Table 8 presents the results from the regression analysis. The results for the overall model for this regression were statistically significant, $F(1, 175) = 6.05$, $p = .001$, with a small effect $R^2 = .095$. In further examination of the multiple regression model, none of the independent variables, locus of control ($p = .57$), academic self-concept ($p = .26$), or interaction of locus of control with academic self-concept ($p = .86$), made a significant individual contribution to the 9.5% variance accounted for by the overall regression model. The non-significance of the interaction variable

(locus of control with academic self-concept) indicates there is no moderation effect between locus of control and academic self-concept when regressed on external factors related to motivation for academic dishonesty in this study.

Discussion

The current study evaluated a measure of academic dishonesty and examined high ability college students' loci of control and its effect on behaviors of academic dishonesty, as moderated by academic self-concept. In addition, high-ability students in an honors program were compared to high-ability students who were not enrolled in an honors program.

The *Motivation for Academic Dishonesty* scale developed for the current study is a modification of the Motivation for Cheating scale created by Geddes (2011). The initial principal components analysis indicated that three items had low initial loadings and cross loaded on both factors. Once those three items were removed, the rerun of the principal components analysis revealed a clear two factor structure for the 17-item scale. This result is different than the three

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Table 6
Descriptive Statistics for Variables of Interest

		Whole-Group (n=357)				Honors (n=179)				Non-honors (n=178)			
		M	*SD*	*Skew*	*Kurt*	*M*	*SD*	*Skew*	*Kurt*	*M*	*SD*	*Skew*	*Kurt*
Locus of Control	23*	12.50	4.22	-.19	-.46	12.08	4.08	-.17	-.62	12.92	4.33	-.24	-.32
Acad. Self-Concept	8*	6.41	0.89	-.79	.89	6.54	0.78	-.72	1.04	6.28	.98	-.71	.50
Composite Academic Dishonesty (17)	85*	19.89	8.65	5.66	39.42	19.20	8.34	6.61	47.68	21.79	9.46	5.22	38.61
	5*	1.17**	0.52			1.13**	0.49			2.18**	0.56		
External (10)	50*	12.21	6.20	4.75	26.05	11.69	5.85	5.80	35.58	13.94	7.05	3.99	20.28
	5*	1.22**	0.62			1.17**	.59			1.39**	0.71		
Internal (7)	35*	7.68	3.08	8.69	87.21	7.51	3.12	9.55	96.84	7.85	3.04	7.94	80.74
	5*	1.10**	0.44			1.07**	0.45			1.12**	0.43		

Note: * possible total score, **mean rate of academic dishonesty (0 = never, 5 = 5 or more times)

category structure of the questionnaire developed by Geddes. Researchers in the current study interpreted the two factors as internal (e.g., perceived ability) and external (e.g., teacher's fault) forces that influence academic dishonesty.

Moderation analysis was not conducted with the aggregate group, nor with the honors group, because locus of control and academic dishonesty were not correlated in those groups. Correlation results in the non-honors group, though, showed a small yet significant correlation between locus of control and the external motivation for academic dishonesty factor. However, locus of control did not significantly contribute to the regression model. That locus of control did not predict academic dishonesty is not in line with previous research in this area, which has shown that an external locus of control is related to an increase in academic dishonesty (Gallagher, 2010; Karabenick & Srull, 1978; Lefcourt, 1982; Pino & Smith, 2003). This previous research was conducted with average ability students, though, and cannot be generalized to gifted students. Future research should continue to explore the loci of control of gifted students, in particular, as very little is known about the impact of loci of control on academic outcomes among gifted students.

The correlation between academic self-concept and academic dishonesty in both the honors and the non-honors groups supports previous research that suggests negative or lowered beliefs about one's academic abilities is related to an increase in academically dishonest behavior (Murdock & Anderman, 2006). Indeed, post hoc analyses show lowered academic self-concept is a predictor of academic dishonesty for non-honors ($F[2, 175] = 10.38$, $p = .006$; see Table 9) and honors students ($F[1, 177] = 6.06$; $p = 0.02$; see Table 10). Future research should examine other factors that influence academic self-concept among high ability college students in order to more clearly recognize trends regarding precursors to academic dishonesty.

Table 7

Correlation Matrix between Variables by Group

		Composite				
		1	2	3	4	5
1	Academic Dishonesty (composite)	1.00				
2	Academic Dishonesty (internal motivation)	0.86**	1.00			
3	Academic Dishonesty (external motivation)	0.97**	0.70**	1.00		
4	Academic Self-Concept	-0.26**	- 0.24*	-0.24**	1.00	
5	Locus of Control	-0.05	- 0.07	-0.07	0.17*	1.00
		Honors				
1	Academic Dishonesty (composite)	1.00				
2	Academic Dishonesty (internal motivation)	0.85**	1.00			
3	Academic Dishonesty (external motivation)	0.96**	0.70**	1.00		
4	Academic Self-Concept	-0.18**	- 0.13	-0.19**	1.00	
5	Locus of Control	0.11	0.11	0.09	0.13	1.00
		Non-Honors				
1	Academic Dishonesty (composite)	1.00				
2	Academic Dishonesty (internal motivation)	0.85**	1.00			
3	Academic Dishonesty (external motivation)	0.97**	0.71**	1.00		
4	Academic Self-Concept	-0.29**	- 0.33**	-.25**	1.00	
5	Locus of Control	-0.21**	- 0.11	-.23**	0.23*	1.00

* $p < 0.05$, **$p<0.001$

Table 8

Regression External Motivation for Academic Dishonesty – Non-Honors

Variable	b	95% CI of b		β	p
		Lower	Upper		
Locus of Control (LOC)	-1.76	-2.01	1.12	-0.27	0.57
Academic Self-Concept (ASC)	-0.45	-4.85	1.32	-0.24	0.26
Interaction (LOC X ASC)	0.02	-0.22	0.26	0.10	0.89
R	0.308				
R^2	0.095				
F	6.059				

Table 9

Multiple Regression External Motivation for Academic Dishonesty – Non-Honors

Variable	b	95% CI of b		β	p	r_s^2
		Lower	Upper			
Locus of Control (LOC)	-0.30	-0.54	-0.07	-0.19	0.01	0.74
Academic Self-Concept (ASC)	-1.50	-2.56	-0.43	-0.21	0.01	0.81
R	0.31					
R^2	0.09					
F	9.12					

Table 10

Regression, External Motivation for Academic Dishonesty – Honors

Variable	b	95% CI of b		β	p
		Lower	Upper		
Academic Self-Concept (ASC)	-1.94	-3.50	-0.39	-.18	0.02
R	0.18				
R^2	0.03				
F	6.06				

Limitations and Directions for Future Research

The current sample was obtained at only two institutions and by using a convenience sampling method, both of which naturally limit the generalizability of the findings. Future research should replicate the current study across multiple institutions and multiple groups of high ability college students, and also with the use of an average ability control group. The following limitations should be understood with the lack of generalizability of the current study in mind.

The designation of "high ability" students in this study was based solely on students' SAT/ACT scores. While SAT/ACT scores are almost always used in admissions decisions to higher education and to honors programs within higher education (Digby, 1999; Pascarella & Terenzini, 1991; 2005), a standardized test score is not necessarily indicative of one's intellectual capacity (Bridgeman, 2005). While we have avoided using the term "gifted" in reference to the current sample, and focused on "high ability" students instead, the problems in using SAT/ACT scores as a measure of ability is still noteworthy. However, the lack of a stronger indicator makes using SAT/ACT scores the most appropriate choice at this point in time.

Although grade point average data were not collected in this study, future research should examine the role of grade point average or academic achievement in the relationship between locus of control, academic self-concept, and academic dishonesty. Locus of control and academic self-concept likely affect academic achievement, and academic achievement and academic dishonesty are typically negatively related (Crown & Spiller, 1998; Haines et al., 1986; McCabe & Trevino, 1997; Singhal, 1982; Whitley, 1998). Because high ability students are often high achievers, the role of academic achievement could be particularly salient among this population.

Rates of academic dishonesty were self-reported in the current study. Miller, Shoptaugh, and Parkerson (2008) found that using a volunteer sampling procedure (such as was used in the current study) leads to an underreporting of cheating behaviors. This could happen for a variety of reasons: 1) those who cheat regularly may avoid participating in a research project that blatantly asks about academically dishonest behaviors (Miller et al., 2008); 2) concerns about anonymity (Scheers & Dayton, 1987); or 3) gender of the participant (McCabe & Trevino, 1997). Thus, the potential underreporting of academically dishonest behavior in the current study could significantly impact the findings, such that true reporting of academically dishonest behavior may impact the model tested in this study. Further, academic dishonesty could be measured differently, such that actual rates of academic dishonesty are measured rather than motivation for academic dishonesty.

Future research should examine locus of control, academic self-concept, and academic dishonesty in a domain-specific manner. Indeed, research indicates ability attributions are domain-specific for gifted individuals, whereas effort attributions are generalizable across academic domains (Li & Adamson, 1995). Academic self-concept is also domain-specific, particularly as individuals get older (Marsh, 1990). Thus, it follows that academic dishonesty may only occur in domain-specific areas.

Finally, future research should examine other mediators and moderators in the relationship between locus of control, academic self-concept, and academic dishonesty. For example, among high ability students, such issues as intrinsic respect for the teacher and the coursework, motivation, or goal orientation (wanting to master the material versus simply pass an exam or course) might be influential in one's decision to engage in academically dishonest behavior.

Conclusion

Results from the current study suggest previous relationships found between locus of control and academic dishonesty among average ability samples may differ among high ability college students. While academic self-concept remains an important variable in the prediction of academic dishonesty, it does not moderate the relationship between locus of control and

academic dishonesty in the current sample. Other achievement-related beliefs need to be explored as precursors to academic self-concept, and as predictors of academic dishonesty, among high ability college students.

Appendix A

Feelings about Academic Cheating

Instructions: During the previous academic year, did you cheat on a homework assignment, project, research paper, quiz, exam, or other academic assignment for any of the following reasons? Rate on a 0 (*never*) to 5 (*five or more times*) scale.

1) Driven by high GPA
2) To maintain eligibility for a scholarship
3) More competitive for graduate school or professional school admission
4) Too many tests on one day
5) School workload too heavy
6) Easier than studying
7) Others' cheating puts you at a disadvantage
8) Teachers' demands are unreasonable
9) The material is not important
10) Need to excel at any cost
11) Teacher did not adequately explain material
12) Didn't have the ability to do well in the class without cheating
13) Pressure from parents
14) Job leaves no time for studying
15) Illness prevents adequate preparation
16) To maintain eligibility for athletic qualification
17) Unfair teacher
18) Overly harsh grading
19) Lack of effort/ did not study or attend class
20) Others cheat

References

Abilock, D. (2009). Guiding the gifted to honest work. *Knowledge Quest, 37*, 12-15.

Ablard, K. E. (1997). Self-perceptions and needs as a function of type of academic ability and gender. *Roeper Review, 20*, 110-115. doi: 10.1080/02783199709553870

Alarape, A. I., & Onakoya, A. Y. (2003). Correlates of examination cheating behavior among university students. *IFE Psychologia: An International Journal, 11*, 71-79.

Anazonwu, C. O. (1995). Locus of control, academic self-concept, and attribution of responsibility for performance in statistics. *Psychological Reports, 77,* 367-370. doi: 10.2466/pr0.1995.77.2.367

Rinn, A.N., & Boazman, J.

Antion, D. L., & Michael, W. B. (1983). Short-term predictive validity of demographic, affective, personal, and cognitive variables in relation to two criterion measures of cheating behaviors. *Educational and Psychological Measurement, 43*, 467-482. doi: 10.1177/001316448304300216

Arvidson, C. J. (2004). *The anatomy of academic dishonesty: Cognitive development, self-concept, neutralization techniques, and attitudes towards cheating* (Unpublished doctoral dissertation). University of North Texas, Denton, TX.

Assouline, S. G., Colangelo, H., Ihrig, D., & Forstadt, L. (2006). Attributional choices for academic success and failure by intellectually gifted students. *Gifted Child Quarterly, 50*, 283-294. doi: 10.1177/001698620605000402

Benson, H., Kornhaber, A., Kornhaber, C., Lechanu, M., Zuttermeister, P., Myers, P., & Friedman, R. (1994). Increases in positive psychological characteristics with a new relaxation-response curriculum in high school students. *Journal of Research and Development in Education, 27,* 226-231.

Beretvas, S. N., Suizzo, M., Durham, J. A., & Yarnell, L. M. (2008). A reliability generalization study of scores on Rotter's and Nowicki-Strickland's locus of control scales. *Educational and Psychological Measurement, 68*, 97-119. doi: 0.1177/0013164407301529

Bridgeman, B. (2005). Unbelievable results when predicting IQ from SAT scores: A commentary on Frey and Detterman (2004). *Psychological Science, 16*, 745-746. doi: 10.1111/j.1467-9280.2005.01606.x

Carden, R., Bryant, C., & Moss, R. (2004). Locus of control, test anxiety, academic procrastination, and achievement among college students. *Psychological Reports*, *95*, 581-582. doi: 10.2466/pr0.95.2.581-582

Carton, J. S., & Nowicki, Jr., S. (1994). Antecedents of individual differences in locus of control of reinforcement: A critical review. *Genetic, Social and General Psychology Monographs, 120*, 33-82.

Center for Academic Integrity. (2007). *Facts about plagiarism*. Retrieved from http://www.plagiarism.org/plag_facts.html

Chan, L. K. S. (1996). Motivational orientations and metacognitive abilities of intellectually gifted students. *Gifted Child Quarterly*, *40*, 184-194. doi: 10.1177/001698629604000403

Colangelo, N., Kelly, K. R., & Schrepfer, R. M. (1987). A comparison of gifted, general, and special learning needs students on academic and social self-concept. *Journal of Counseling and Development, 66*, 73-77. doi: 10.1002/j.1556-6676.1987.tb00802.x

Coleman, N., & Mahaffey, T. (2000). Business student ethics: Selected predictors of attitudes toward cheating. *Teaching Business Ethics, 4*, 121-136. doi: 10.1023/A:1009855128668

Collier, R. G., Jacobsen, M. G., & Stahl, S. A. (1987). Locus of control measurements for gifted and nongifted children. *Roeper Review, 9*, 196-200. doi: 10.1023/A:1009855128668

Crandall, V. C., & Crandall, B. W. (1983). Maternal and childhood behaviors as antecedents of internal-external control perceptions in young adulthood. In H. M. Lefcourt (Ed.), *Research with the locus of control construct. Vol. 2. Developments and social problems* (pp. 53-103). San Diego, CA: Academic Press.

Crown, D. F., & Spiller, M. S. (1998). Learning from the literature on collegiate cheating: A review of empirical research. *Journal of Business Ethics, 17*, 229-246. doi: 10.1023/A:1017903001888

Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm (with discussion). *Journal of the Royal Statistical Society, 39,* 1-38.

Dey, E. (1997). Working with low survey response rates: The efficacy of weighting adjustments. *Research in Higher Education, 38*, 215-227. doi: 10.1023/A:1024985704202

Digby, J. (1999). *Peterson's honors programs: The official guide of the National Collegiate Honors Council* (2nd ed.). Princeton, NJ: Peterson's.

Downs, W. R., & Rose, S. R. (1991). The relationship of adolescent peer groups to the incidence of psychosocial problems. *Adolescence, 26*, 473-492.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal, 8,* 430-457. doi: 10.1207/S15328007SEM0803_5

Fimian, M. J., & Cross, A. H. (1986). Stress and burnout among preadolescent and early adolescent gifted students: A preliminary investigation. *Journal of Early Adolescence, 6*, 247-267. doi: 10.1177/0272431686063004

Findley, M. J., & Cooper, H. M. (1983). Locus of control and academic achievement: A literature review. *Journal of Personality and Social Psychology, 44*, 419-427. doi: 10.1037/0022-3514.44.2.419

Gadzella, B. M., Williamson, J. D., & Ginther, D. W. (1985). Correlations of self-concept with locus of control and academic performance. *Perceptual and Motor Skills, 61*, 639-645. doi: 10.2466/pms.1985.61.2.639

Gallagher, J. A. (2010). *Academic integrity and personality* (Unpublished Master's thesis). California State University: Long Beach, CA.

Gardner, W. M., & Melvin, K. B. (1988). A scale for measuring attitude toward cheating. *Bulletin of the Psychonomic Society, 26,* 429-432. doi: 10.3758/BF03334905

Geddes, K. A. (2011). Academic dishonesty among gifted and high-achieving students. *Gifted Child Today, 34*, 50-56.

Haines, V. J., Diekhoff, G. M., LaBeff, E. E., & Clark, R. E. (1986). Immaturity, lack of commitment, and the neutralizing attitude. *Research in Higher Education, 25*, 342-354. doi: 10.1007/BF00992130

Harty, H., Adkins, D., & Hungate, E. (1984). Exploring self-concept and locus of control of students in two recognized approaches to elementary school gifted education. *Roeper Review, 7*, 88-91. doi: 10.1080/02783198409552857

Heider, F. (1958). *The psychology of interpersonal relationships.* New York, NY: Wiley. doi: 10.1037/10628-000

Heller, K. A., & Ziegler, A. (1996). Gender differences in mathematics and the sciences: Can attributional retraining improve the performance of gifted females? *Gifted Child Quarterly, 40*, 200-210. doi: 10.1177/001698629604000405

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30,* 179–185. doi: 10.1007/BF02289447

Jones, D. L. R. (2011). Academic dishonesty: Are more students cheating? *Business Communication Quarterly, 74*, 141-150. doi: 10.1177/1080569911404059

Juster, F. T., & Smith, J. P. (1997). Improving the quality of economic data: Lessons from the HRS and AHEAD. *Journal of the American Statistical Association, 92,* 1268-1278. doi: 10.1080/01621459.1997.10473648

Kanoy, R. C., Johnson, B. W., & Kanoy, K. W. (1980). Locus of control and self-concept in achieving and underachieving bright elementary students. *Psychology in the Schools, 17*, 359-399. doi: 10.1002/1520-6807(198007)17:3<395::AID-PITS2310170320>3.0.CO;2-N

Karabenick, S. A., & Srull, T. K. (1978). Effects of personality and situational variation in locus of control on cheating: Determinants of the "congruence effect." *Journal of Personality, 46,* 72-95. doi: 10.1111/j.1467-6494.1978.tb00603.x

Karnes, F. A., & D'Ilio, V. R. (1991). Locus of control in rural southern elementary gifted students. *Psychological Reports, 69*, 927-928. doi: 10.2466/pr0.1991.69.3.927

Keith, T. Z., Pottebaum, S. M., & Eberhardt, S. (1986). Effects of self-concept and locus of control on academic achievement: A large-sample path analysis. *Journal of Psychoeducational Assessment, 4*, 61-72. doi: 10.1177/073428298600400107

Kirkpatrick, M. A., Stant, K., & Downes, S., & Gaither, L. (2008). Perceived locus of control and academic performance: Broadening the construct's applicability. *Journal of College Student Development, 49*, 486-496. doi: 10.1353/csd.0.0032

Knight, B. A. (1995). The influence of locus of control on gifted and talented students. *Gifted Education International, 11*, 31-33.

Kormanik, M. B., & Rocco, T. S. (2009). Internal versus external control of reinforcement: A review of the locus of control construct. *Human Resource Development Review, 8*, 463-483. doi: 10.1177/1534484309342080

LaBeff, E. E., Clark, R. E., Haines, V. J., Diekhoff, G. M. (1990). Situational ethics and college cheating. *Sociological Inquiry, 60*, 190-198. doi: 10.1111/j.1475-682X.1990.tb00138.x

Laffoon, K. S., Jenkins-Friedman, R., & Tollefson, N. (1989). Casual attributions of underachieving gifted, achieving gifted, and nongifted students. *Journal for the Education of the Gifted, 13*, 4-21.

Lefcourt, H. M. (1966). Internal versus external control of reinforcement: A review. *Psychological Bulletin, 65,* 206-220. doi: 10.1037/h0023116

Lefcourt, H. M. (1982). *Locus of control: Current trends in theory and research* (2nd ed.). Hillsdale, NJ: Erlbaum.

Lent, R. W., Brown, S. D., & Gore, P. A. (1997). Discriminant and predictive validity of academic self-concept, academic self-efficacy, and mathematics-specific self-efficacy. *Journal of Counseling Psychology, 44*, 307-315. doi: 10.1037/0022-0167.44.3.307

Li, A. K. F., & Adamson, G. (1995). Motivational patterns related to gifted students' learning of mathematics, science, and English: An examination of gender differences. *Journal for the Education of the Gifted, 18*, 284-297. doi: 10.1177/016235329501800305

Litster, K., & Roberts, J. (2011). The self-concepts and perceived competencies of gifted and non-gifted students: A meta-analysis. *Journal of Research in Special Educational Needs, 11*, 130-140. doi: 10.1111/j.1471-3802.2010.01166.x

Marsh, H. W. (1986). Self-serving effect (bias?) in academic attributions: Its relation to academic achievement and self-concept. *Journal of Educational Psychology, 78*, 190-200. doi: 10.1037/0022-0663.78.3.190

Marsh, H. W. (1989). *Self-Description Questionnaire (SDQ) III: A theoretical and empirical basis for the measurement of multiple dimensions of late adolescent self-concept: An interim test manual and a research monograph.* New South Wales, Australia: University of Western Sydney.

Marsh, H. W. (1990). Influences of internal and external frames of reference on the formation of math and English self-concepts: A multiwave, longitudinal panel analysis. *Journal of Educational Psychology, 82*, 107-116. doi: 10.1037/0022-0663.82.1.107

Marsh, H. W., & Bryne, B. M. (1993). Do we see ourselves as others infer: A comparison of self-other agreement on multiple dimensions of self-concept from two continents. *Australian Journal of Psychology, 45*, 49-58. doi: 0.1080/00049539308259118

Marsh, H. W., & O'Neill, R. (1984). Self Description Questionnaire III: The construct validity of multidimensional self-concept ratings by late adolescents. *Journal of Educational Measurement, 21,* 153-174. doi: 10.1111/j.1745-3984.1984.tb00227.x

Marsh, H. W., & Shavelson, R. (1985). Self-concept: Its multifaceted, hierarchical structure. *Educational Psychologist, 20*, 107-123. doi: 10.1207/s15326985ep2003_1

Martin, N. K., & Dixon, P. N. (1994). The effects of freshman orientation and locus of control on adjustment to college: A follow-up study. *Social Behavior and Personality, 22*, 201-208. doi: 10.2224/sbp.1994.22.2.201

Mathiasen, R. E. (1985). Characteristics of the college honors student. *Journal of College Student Personnel, 26*, 171-173.

McCabe, D. L., & Trevino, L. K. (1997). Individual and contextual influences on academic dishonesty: A multi-campus investigation. *Research in Higher Education, 38*, 522-538. doi: 10.1023/A:1024954224675

McCabe, D. L., Trevino, L. K., & Butterfield, K. D. (2001). Cheating in academic institutions: A decade of research. *Ethics and Behavior, 11*, 219-232. doi: 10.1207/S15327019EB1103_2

Mehta, M. (2009). Importance of relationship between locus of control and academic achievement of senior secondary schools. *The Journal of Progressive Education, 2*, 75-78.

Miller, A., Shoptaugh, C., & Parkerson, A. (2008). Under reporting of cheating in research using volunteer college students. *College Student Journal, 42*, 326-339.

Morrow, K. A. (1989). Locus of control and rural-urban status in gifted high school students. *Roeper Review, 11,* 207-208. doi: 10.1080/02783198909553212

Murdock, T. B., & Anderman, E. M. (2006). Motivational perspectives on student cheating: Toward an integrated model of academic dishonesty. *Educational Psychologist, 41* 129-145. doi: 10.1207/s15326985ep4103_1

Newstead, S. E., Franklyn-Stokes, A., & Armstead, P. (1996). Individual differences in student cheating. *Journal of Educational Psychology, 88*, 229-241. doi: 10.1037/0022-0663.88.2.229

Noel, J. G., Forsyth, D. R., & Kelley, K. N. (1987). Improving the performance of failing students by overcoming their self-serving attributional biases. *Basic and Applied Social Psychology, 8*, 151-162. doi: 10.1080/01973533.1987.9645882

Nokelainen, P., Tirri, K., & Merenti-Välimäki, H. (2007). Investigating the influence of attribution styles on the development of mathematical talent. *Gifted Child Quarterly, 51*, 64-81. doi: 10.1177/0016986206296659

Owunwanne, D., Rustagi, N., & Dada, R. (2010). Students' perceptions of cheating and plagiarism in higher institutions. *Journal of College Teaching and Learning, 7*, 59-68.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco, CA: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (Vol. 2). San Francisco, CA: Jossey-Bass.

Pavella, G. (1997). Applying the power of association on campus: A model code of academic integrity. *Journal of College and University Law, 24,* 97-118.

Pearson, K. (1895). Mathematical contributions to the theory of evolution III. Regression, heredity and pan ixia (abstract). *Proceedings of the Royal Society of London, 59,* 69-71. doi: 10.1098/rspl.1895.0058

Peugh, J. & Enders, C. (2004). Missing data in educational research: A review of reporting practices and suggestions for improvement. *Review of Educational Research, 74,* 525-556. doi: 10.3102/00346543074004525

Pino, N W., & Smith, W. L. (2003). College students and academic dishonesty. *College Student Journal, 37,* 490-500.

Prihadi, K., & Hairul, N. I. (2011). How locus of control moderates the effect of perceived teachers' expectancy and self-esteem among high-performing students. *Problems of Education in the 21st Century, 34*, 110-121.

Pyryt, M. C., & Mendaglio, S. (1994). The multidimensional self-concept: A comparison of gifted and average-ability adolescents. *Journal for the Education of the Gifted, 17*, 299-305. doi: 10.1177/016235329401700307

Rettinger, D. A., & Kramer, Y. (2009). Situational and personal causes of student cheating. *Research in Higher Education, 50*, 293-313. doi: 10.1007/s11162-008-9116-5

Rinn, A. N. (2005). Trends among honors college students: An analysis by year in school. *The Journal of Secondary Gifted Education, 16*, 157-167.

Rinn, A. N. (2007). Effects of programmatic selectivity on the academic achievement, academic self-concepts, and aspirations of gifted college students. *Gifted Child Quarterly, 51*, 232-245. doi: 10.1177/0016986207302718

Rinn, A. N., & Cunningham, L. G. (2008). Using self-concept instruments with high ability college students: Reliability and validity evidence. *Gifted Child Quarterly, 52*, 232-242. doi: 10.1177/0016986208319458

Rinn, A. N., Plucker, J. A., & Stocking, V. B. (2010). Fostering gifted students' affective development: A look at the impact of academic self-concept. *Teaching Exceptional Children, 6*, 2-13.

Rotter, J. B. (1954). *Social learning and clinical psychology.* Englewood Cliffs, NJ: Prentice-Hall. doi: 10.1037/10788-000

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, 1-28. doi: 10.1037/h0092976

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Counseling and Clinical Psychology, 43*, 56-67. doi: 10.1037/h0076301

Scheers, N. J., & Dayton, M. (1987). Improved estimation of academic cheating behavior using the randomized response technique. *Research in Higher Education, 26*, 61-69. doi: 10.1007/BF00991933

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist, 26*, 207-231. doi: 10.1080/00461520.1991.9653133

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Validation of construct interpretations. *Review of Educational Research, 46*, 407-441. doi: 10.3102/00346543046003407

Siegle, D., & Reis, S. M. (1998). Gender differences in teacher and student perceptions of students' ability and effort. *Gifted Child Quarterly, 42*, 39-47. Doi: 10.1177/001698629804200105

Siegle, D., Rubenstein, L. D., Pollard, E., & Romey, E. (2010). Exploring the relationship of college freshmen honors students' effort and ability attribution, interest, and implicit theory of intelligence with perceived ability. *Gifted Child Quarterly, 54*, 92-101. doi: 10.1177/0016986209355975

Sierra, J. J., & Hyman, M. R. (2006). A dual-process model of cheating intentions. *Journal of Marketing Education, 28,* 193-204. doi: 10.1177/0273475306291464

Singhal, A. C. (1982). Factors in students' dishonesty. *Psychological Reports, 51*, 775-780. doi: 10.2466/pr0.1982.51.3.775

Smith, C. L., Sapp, M., Farrell, Jr., W. C., & Johnson, Jr., J. H. (1998). Psychoeducational correlates of achievement for high school seniors at a private school: The relationship among locus of control, self-esteem, academic achievement, and academic self-esteem. *The High School Journal, 81*, 161-166.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Allyn and Bacon.

Trevino, L. K., & Youngblood, S. A. (1990). Bad apples in bad barrels: A casual analysis of ethical decision-making behavior. *Journal of Applied Psychology, 75,* 378-385. doi: 10.1037/0021-9010.75.4.378

Vandehey, M., Diekhoff, G., & LaBeff, E. (2007). College cheating: A twenty-year follow-up and the addition of an honor code. *Journal of College Student Development, 48*, 468-480. doi: 10.1353/csd.2007.0043

Weiner, B. (Ed.). (1974). *Achievement motivation and attribution theory.* Morristown, NJ: General Learning Press.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573. doi: 10.1037/0033-295X.92.4.548

West, T., Ravenscroft, S. P., & Shrader, C. B. (2004). Cheating and moral judgment in the college classroom: A natural experiment. *Journal of Business Ethics, 54,* 173-183. doi: 10.1007/s10551-004-9463-x

What is Plagiarism? (n.d.) Retrieved from http://www.plagiarism.org/learning_center/what_is_plagiarism.html

Whitley, Jr., B. E. (1998). Factors associated with cheating among college students: A review. *Research in Higher Education, 39*, 235-274. doi: 10.1023/A:1018724900565

Yong, F. L. (1994). Self-concepts, locus of control, and Machiavellianism of ethnically diverse middle school students who are gifted. *Roeper Review, 16,* 192-194. doi: 10.1080/02783199409553571

Geological time, biological events and the learning transfer problem

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Abstract: Comprehension of geologic time does not come easily, especially for students who are studying the earth sciences for the first time. This project investigated the potential success of two teaching interventions that were designed to help non-science majors enrolled in an introductory geology class gain a richer conceptual understanding of the geologic time scale. Our research centered on the results of those interventions since we hypothesized that students who correctly answered exam questions on relative geologic time early in the semester would be able to respond with equal facility to exam questions at the end of the semester that asked them to apply relative geologic time to associated biologic events.

The instructor of the course began this study by using the Decoding the Disciplines model (Pace & Middendorf, 1998). During the first step of the model, the instructor identified the place where a majority of students in previous classes had the greatest difficulty; that is, in addressing the relative geologic time scale. Next, the instructor articulated the mental moves an expert geologist makes when solving problems using the geological time scale. During lecture the instructor modeled those very same mental tasks for students. Students were then given the opportunity to practice those mental tasks by creating their own personal timeline. Later in the course students completed the second intervention, a categorization grid that also functioned as a classroom assessment of their learning. Students were given exams after both interventions were completed.

Results from the first and second interventions indicated that students were able to understand the conceptual framework of the relative geological time scale. On an exam administered after both interventions were completed, 66% of the students answered correctly the questions about relative geologic time, an indication that they had gained conceptual knowledge of the subject. In contrast, only 36% of students answered correctly the exam questions at the end of the semester that focused on relative geologic time with associated biologic events. Pearson Chi-Square tests with P<0.05 were used to test our hypothesis. Statistically significant results at P=0.00 were attained for all tests, indicating the hypothesis can be rejected.

We conclude that a second, more prevalent, underlying problem exists for non-science majors, one that Thorndike and Woodworth (1901), Byrnes (1996), Bransford, Brown, and Cocking (2000) and Bransford and Schwartz (2001) describe as the learning transfer problem. Similar problems have been discussed

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as a knowledge transfer problem (Graham et al., 2006). Learning transfer is problematic for students using the geological time scale and calls for additional classroom interventions – interventions designed and scaffolded to provide students the opportunity to practice the set of difficult mental moves required to apply biological events to the relative geological timeline.

Keywords: decoding the disciplines, teaching education

Introduction

Dating of the Earth, and subsequent development of the geologic time scale, have been fundamental to furthering our understanding of the origins of Earth and of the evolution of life. As early as the 1600's, naturalists and scientists endeavored to assign relative ages to Earth's sedimentary layers, and to its mineral and fossil content. Through the 1800's and by the early 1900's, major breakthroughs in field observations and laboratory experiments allowed for widespread establishment and acceptance of methodologies to date Earth's processes and products. These methodologies now center on relative time - a comparative relationship of older and younger events such as deposition of layers of rocks or age of fossils, and absolute time – a numerical expression of ages established from comparison between the observed abundance of a radioactive isotope and its decay products using known decay rates. Relative and absolute time merge to produce the conventional geologic time scale.

The concept of dating the Earth is so fundamental that the Benchmarks for Science Literacy, in an aim to increase adult literacy about the sciences, proposed that knowledge about the changing conceptualization of the age of the Earth be taught in grades 9-12 (American Association for the Advancement of Science, 2009). AAAS Benchmarks for Science Literacy focus on broad themes of "Extending Time" and "Moving Continents" that pair well with "Evolution of Life" themes. As examples, "Moving Continents" places plate tectonics into an evolving earth perspective, and the "Evolution of Life" theme focuses on evolutionary change over geologic time (for grades 6 -8), and the mechanisms of change for older students (grades 9-12). AAAS recommendations focus on this foundational knowledge about the evolution of Earth and life as the way to better prepare students for further exploration in college-level courses.

The teaching and student learning of evolutionary concepts of Earth and life are arguably an essential component of a general college education. However, student difficulty with understanding geologic time is established in the literature (Trend, 1998; Zen, 2001; Cheek, 2012; Cately & Novak, 2009; DeLaughter & Stein, 1998; Dodick & Orion, 2003), and methods to enhance learning have been investigated (Zhu et al., 2012; Pyle, 2007; Richardson, 2000; Hemler & Repine, 2002; Nieto-Obregon, 2000; Ritger & Cummins, 1991). In essence, researchers reported that students lack the conceptual framework that allows them to make sense of the immense time scale of geologic time (Catley & Novick, 2009). Geologic time has been described as a threshold concept (Cheek, 2010; Meyer & Land, 2006) - a concept difficult to grasp, fundamental to the grounding in a given discipline and essential for the student to understand before moving on to more difficult mental tasks.

Despite the numerous research publications on the subject of geologic time in the education literature, research on student learning of the geologic time scale remains important because students from disciplines as diverse as the social sciences, humanities and arts enroll in undergraduate geological sciences courses each semester. To these non-geology major students,

instructors provide an education about Earth's processes – whether the course for undergraduate students has a focus on historical geology, physical geology, or environmental geology, or any such course that allows for the students to gain a perspective on the temporal sequence of unfolding of Earth's events or processes. A full comprehension of geologic time allows students to view the Earth's integrated biologic, chemical and physical events in their temporal sequence. We assert that mastery of the concept of geologic time, inclusive of relative and absolute geologic time, is not a goal for undergraduate non-science majors, but that a fundamental application of relative geologic time and associated events should be considered an achievable learning outcome for students enrolled in a non-majors geological sciences course.

Our research objective was to investigate if students in a non-science majors undergraduate course in a large Midwestern university are learning the concept of the relative geologic time scale, and are able to apply biologic events that occurred in Earth's history to the relative geologic time scale at the end of the semester with a probability that is better than chance alone. Results from pre- and post-pedagogical intervention activities pertaining to student learning and understanding of geologic time administered in the undergraduate classroom in the 2012, 2011 and 2010 fall semesters comprise our database. In each semester, approximately two-thirds of the classroom student population that participated in this study were lower division freshman and sophomores and one-third was upper division students.

The course *Dinosaurs and Their Relatives* in a geosciences department in a large, state-supported Midwestern university in the U.S. was targeted for our research because this course focused almost entirely on relative geologic time and biologic events, instead of geologic time and chemical, physical and biological events more typical for an undergraduate non-science majors geology course. Our focused research objective was designed to analyze student learning of relative geologic time and terms early in the semester, and of relative geologic time with associated biologic events by the close of the semester. Our research hypothesis was this: if students learn relative geologic time early in the semester, then they will learn relative geologic time with associated biologic events by the end of the semester with equal facility. Although our intent was to quantify and analyze student learning of the threshold concept of relative geologic time, our research results uncovered another significant problem but one quite common among the STEM disciplines –learning transfer within a given course. Thus, our disciplinary and focused research on geologic time and associated biologic events directed us to identify the larger conceptual issue of learning transfer that is occurring in the classroom.

Methods

To apprehend the complexities of geologic time, lessons and classroom learning activities were designed specifically to help students gain an understanding of the geologic time scale. At the outset of the semester, an exercise was initiated by asking students to draw a vertical line that represents time, from oldest time at the bottom of the page to youngest at the top, and to insert, beginning with their birth, 3-4 significant events that occurred in their lives (see Figure 1). Upon completion, each student constructed a time line similar to the geologic time line, with a list of relative events that occurred at single points in time. A corresponding geologic time summary was given during the class (see Figure 2).
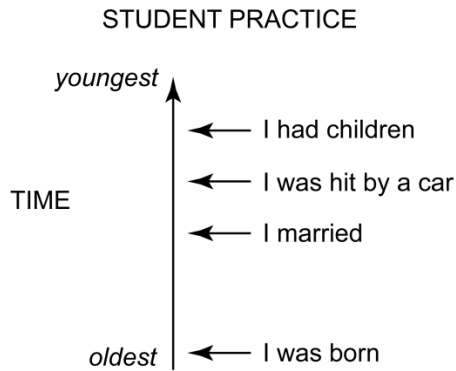
STUDENT PRACTICE

youngest

TIME

← I had children

← I was hit by a car

← I married

oldest ← I was born

Figure 1. An example of a simplified time scale that can be constructed by students in the classroom for the purpose of illustrating the development of a geologic time line, with older to younger time punctuated by important events.
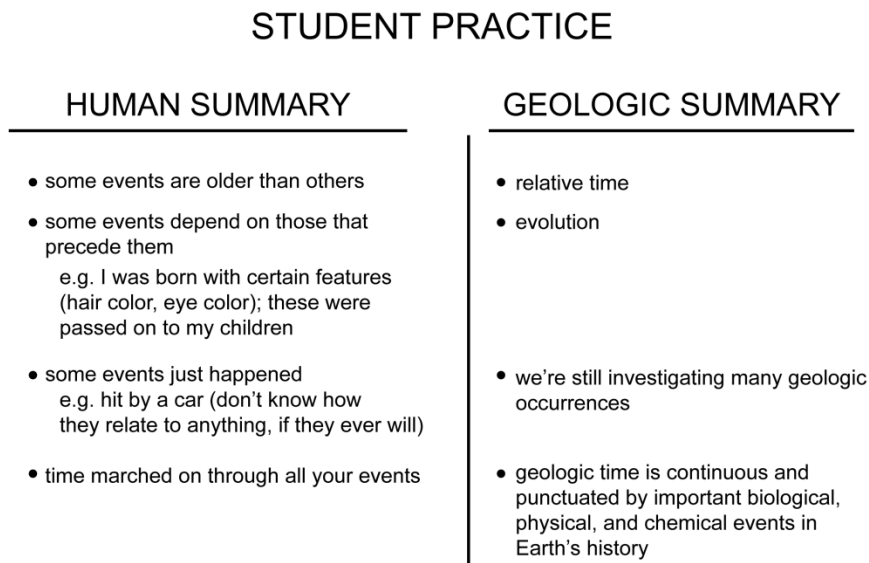
STUDENT PRACTICE

HUMAN SUMMARY

- some events are older than others

- some events depend on those that precede them
  e.g. I was born with certain features (hair color, eye color); these were passed on to my children

- some events just happened
  e.g. hit by a car (don't know how they relate to anything, if they ever will)

- time marched on through all your events

GEOLOGIC SUMMARY

- relative time

- evolution

- we're still investigating many geologic occurrences

- geologic time is continuous and punctuated by important biological, physical, and chemical events in Earth's history

Figure 2. Students learn by association to their own personal experiences, in this case, to events that occurred in their lives. A student-developed time line could be linked to lessons on geologic concepts at this point and/or later in the semester. The instructor can then use the individual student summaries for comparison to geologic topics later in the semester as a means of introducing more complex information; i.e., evolution.

Through a one-hour lesson created by using the *Decoding the Disciplines* method, an instructor modeled the use of the relative geologic time scale to students so that they could link relative geologic time to the readings and classroom lectures throughout the semester. The instructor began the lesson by breaking down the standard textbook example of the geologic time scale columns from the largest to smallest divisions, explaining the terms and numbers, and identifying clearly the position of the present day on the chart. The division boundaries were identified, and erathem boundaries were discussed in relation to major extinction events. A

simplified set of examples followed; i.e., the origin of the dinosaurs was marked at a particular level on the geologic time scale, as was the extinction of the dinosaurs, but it was explained that the dinosaurs lived continuously through many millions of years between the origination and extinction event (see Figure 3). Although a particular event was identified on the simplified time scale as a single point in time by the horizontal arrow (i.e., origin or extinction), the duration of the event may have occurred over many hundreds of thousands or perhaps even millions of years. The relatively shorter duration of geologic time that marked a specific geologic event such as the extinction of the dinosaurs was contrasted with the relatively longer time associated with the duration of the Paleozoic, Mesozoic or Cenozoic eras. It was explained further that time continued through the evolutionary event and through the extinction event and persists to today, much as time will continue tomorrow and will have been punctuated by events that occurred in the students' lives today (see Figure 4). Further examples relating geologic time to the human experience were provided for the students to reinforce the concepts. Familiar topics such as the origin of mammals and the origin of fish were identified on the time scale (see Figure 5). In a similar manner, the age of the Earth in billions of years, the duration of dinosaurs in millions of years and the age of our family members in hundreds and tens of years were provided in one lesson period and reinforced as themes throughout the course.
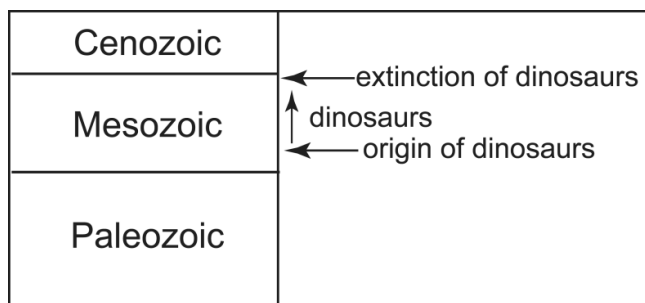
Figure 3. The origin, temporal duration and extinction of the dinosaurs during the Mesozoic are the focal points for the students' attention in this abbreviated geologic time scale. The objective of the lesson is to include geologic information to assist students in practicing terms and concepts related to understanding relative geologic time.

Figure 4. A portion of the relative geologic time scale with oldest and youngest time, and a very approximate position of the beginning of human history in the latest Cenozoic identified on the column. A convention in geology is to use horizontal arrows to point to times during which geologic events occurred in Earth's history. Diagram provides a summary of the lesson that time

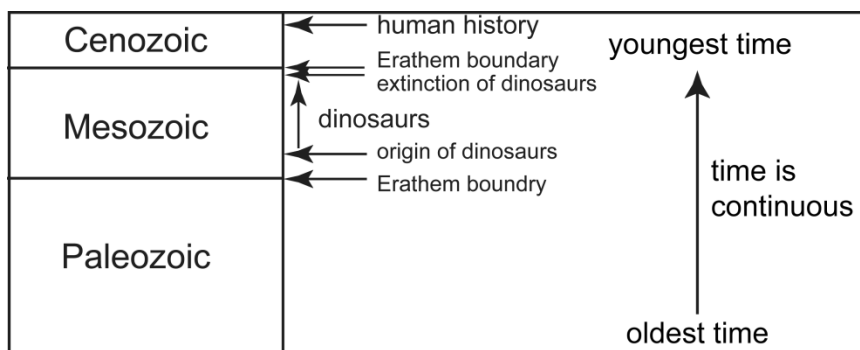is continuous and is punctuated by relatively older events (origin of the dinosaurs) and relatively younger events (extinction of the dinosaurs), as well as extinctions at erathem boundaries, with focus on the Mesozoic.

Cenozoic Era		
Mesozoic Era	Cretaceous	extinction of dinosaurs origin of angiosperms
	Jurassic	origin of birds
	Triassic	(origin of birds) origin of dinosaurs origin of mammals
Paleozoic Era		origin of gymnosperms origin of seedless vascular plants origin of fish

Figure 5. The relative geologic time scale associating the terms for relative geologic time to events that may be familiar to students, such as the origin of fish, origin of mammals, etc.

Another aspect of geologic time conveyed to students was an understanding that some events were of relatively longer *versus* shorter duration. This is a complicated concept because it requires students to hold billions or millions *versus* millions or hundreds of thousands of years in their heads. Specific classroom assessments (Angelo & Cross, 1993) were used to gauge student learning of comparative durations of geologic events and were classified according to the hierarchical learning scheme described by Bloom (1964). Lower level thinking requires students to memorize and comprehend knowledge, while higher learning levels such as analysis, application, synthesis and evaluation require more complex thinking. In our research the *Categorizing Grid*, "a paper and pencil equivalent of sorting objects in a warehouse and putting like ones together in the right bin," (Angelo & Cross, 1993, p. 160) served to evaluate student

comprehension of geologic time in the class. The *Categorizing Grid* required students to sort geologic events of relatively longer duration; e.g., the Mesozoic Era, from events that occurred over a relatively shorter period of geologic time; e.g., origin or extinction of dinosaur groups. The latter events are portrayed commonly on geologic time scales by horizontal arrows pointing to a single point in geologic time (see Figures 3 and 4), although the understanding of the geologist is that the arrow may represent tens, hundreds of thousands or millions of years. *Duration of geologic time* and *a single point in geologic time* were the category titles under which the following list of terms or phrases were to be sorted by the students in the *Grid* (see Figure 6):

- Paleozoic Era
- Mesozoic Era
- Cenozoic Era
- Erathem boundary
- Origin of mammals
- Number of years dinosaurs roamed the Earth
- Origin of the dinosaurs
- Extinction of the dinosaurs
- Number of years mammals existed on Earth
- Evolutionary change that is gradual
- Evolutionary change that is punctuated

All terms and phrases were discussed in previous class lessons and prior to conducting the assessment. The *Categorizing Grid* assessed student understanding of the relative duration of significant geologic terms and events at the comprehension level (Bloom, 1964). The *Categorizing Grid* constituted the second of the interventions discussed in this research study. The *Categorizing Grid* was administered the second week of each of the three semesters for which data were collected for this study.

Categorizing Grid

Duration of geologic time	A single point in geologic time
Paleozoic Era	erathem boundary
Mesozoic Era	origin of mammals
number of years dinosaurs roamed the Earth	extinction of dinosaurs
number of years mammals existed on the Earth	origin of dinosaurs
evolutionary change that is gradual	evolutionary change that is punctuated
Cenozoic Era	

Figure 6. An exercise labeled a *Categorizing Grid* by Angelo and Cross (1993) serves as our example that requires students to utilize knowledge and comprehension of geologic information before placing terms and phrases under the correct heading.

One third of the way through each semester, Exam 1 was administered to all students in the course and the following True/False questions were evaluated.

Exam 1. Question #21. The Cenozoic is older than the Paleozoic.

Exam 1. Question #28. The Paleozoic is younger than the Mesozoic.

Students were instructed in writing on the exam to fill in True or False to complete each statement correctly. Exam 1 was administered during the sixth week of the semester. All exams were collected and corrected soon after students took the exam. Exam 1 was not returned to the students. Correct responses are: The Cenozoic is older than the Paleozoic. False. The Paleozoic is younger than the Mesozoic. False.

The semester course focused on dinosaur evolution, phylogeny, morphology, paleoecology, biogeography, and extinction. Format consisted of classroom presentations by lecture inclusive of images and DVDs of dinosaurs, in-lecture written activities on the Triassic, Jurassic and Cretaceous periods and their association with the major dinosaur groups - theropods, sauropods, anklyosaurs, ceratopsians, ornithopods, stegosaurs, and pachycephalosaurians. Students were required to memorize the Paleozoic, Mesozoic and Cenozoic, Triassic, Jurassic and Cretaceous periods, and the seven names of dinosaur groups. The three periods of the Mesozoic and dinosaur names were reinforced with in-lecture written exercises and DVD viewings numerous times during the 16-week semester.

Exam 3 was administered at the end of each semester. Similar to the previous exam, students were instructed in writing on the exam to fill in True or False to complete each statement correctly. All exams were collected and corrected soon after students took the exam, and the exam was not returned to the students. The two questions were taken from the textbook and evaluated for this second phase of the post-intervention research.

Question #22. Sauropods were much less successful after the Jurassic, but did survive until the end of the Cretaceous. Correct response is True.

Question #33. The middle and Late Cretaceous dinosaurs were mostly hadrosaurs, ceratopsians, anklyosuars and giant sauropods. The correct response is False.

Results and Discussion

Student responses to the first intervention activity (the time line punctuated from oldest to youngest with personal events important to students' lives) indicated that students clearly comprehended the construct of the geologic time line and were able to apply personal experiences in the correct order, from older to younger personal events. In the exercise, 97% (254/263) of the student time lines were constructed correctly. Correct student responses were those that gave the oldest information at the bottom of the time line and progressively younger events upward, with the youngest or most recent event at the top of the page. Incorrect time lines were those that associated a student's birth with the youngest time at the top of the page, thereby producing the reverse of the geologic time scale. At this earliest part of the semester, 97% of students understood the relative ordering of terms as per the geologic time line, with oldest events on the bottom of the page and youngest at the top.

Incorrect student responses to the *Categorizing Grid* exercise, inclusive of placing one or more terms or phrases into the incorrect category and/or exclusion of terms, phrases, and/or category headings, indicated the difficulties students had with understanding geologic time when geologic terminology was paired with relative durations of geologic time early in the semester.

Student responses to Exam 1 questions on relative geologic time were fairly consistent across the three semesters - Fall 2012, 2011, 2010. Results averaged for the three years revealed 66% of students answered the two Exam 1 questions pertaining to relative geologic time correctly (Year 2012: 67%, Year 2011: 70%, Year 2010: 62%; Average 66%; Appendices 1, 2, 3). Questions were posed as True/False so each student had a 50/50 opportunity of attaining the correct answer for each question by chance alone. Our results of 66% average correct responses are better than chance alone and indicate student knowledge of correct responses to questions pertaining to relative geologic time 6 weeks after the semester began.

Student responses to two questions pertaining to relative geologic time with a biologic component on Exam 3 were also fairly consistent across three years. However, results averaged for the three-year duration of the study (2012, 2011, 2010) revealed only 36% of students answered both questions pertaining to relative geologic time with a biologic component correctly on Exam 3 (Year 2012: 35%; Year 2011: 44%; Year 2010: 31%; Average 36%). Questions were posed as True/False with the expectation that a student had a 50/50 chance of arriving at the correct answer for each question by chance alone.

The distribution of correct and incorrect student responses to both questions pertaining to relative geologic time on Exam 1 and to both questions pertaining to relative geologic time with a biologic component on Exam 3 were examined for statistical significance. The hypothesis of no significant difference between the T/F responses from relative geologic time questions on Exam 1 and relative geologic time with a biologic component questions on Exam 3 was tested at P<0.05. Statistically significant results were obtained for all analyses, inclusive of individual years and the three years combined data. Chi-Square tests for individual years yielded P=0.00 (Year 2012: P=0.00; Year 2011: P=0.00; Year 2010: P=0.00), and the same for three years combined data (P=0.00). An examination of a subset of the data – only one question from Exam 1 and only one question from Exam 3 for all years (Exam 1 Q21 (2010-2012) (86% correct) / Exam 3 Q22 (2010-2012) (46% correct) also yielded statistically significant results at P=0.00. Collectively, these results indicate there is a statistically significant difference between student responses to relative geologic time questions given early in the semester (Exam 1) and to relative geologic time with a biologic component questions given at the end of the semester (Exam 3). In other words, students did better than chance on relative geologic time questions early in the semester, but did poorer than chance on relate relative geologic time and biologic components at the end of the semester.

We examined further the data from Exam 3 questions, both directed at relative time with a biologic component, to determine if there was a statistically significant difference between the responses. These additional investigations were conducted because one question required more knowledge of both relative geologic time and dinosaur groups than the other. Again, each question was T/F so the probability of a student attaining the correct response was 50/50. The hypothesis of no significant difference between the T/F responses from these two questions on Exam 3 was tested at P<0.05. Chi-Square tests yielded P=0.00 for all tests. Results indicate a statistically significant difference between student responses to the two questions on relative time with a biologic component.

In total, three analyses of student learning of relative geologic time were prepared from three consecutive years of student responses to True/False questions. First analysis pertained to knowledge of relative geologic time on Exam 1, second to testing knowledge and comprehension of relative geologic time with a biologic component on Exam 3, and third pertained to testing knowledge and comprehension of relative geologic time with a biologic component - with one

question requiring comparatively more knowledge of both relative geologic time and dinosaur groups than the other.

Overall, results from our research indicate that 97% of the students were able to construct *geologic-like* time lines that relate to their own personal experience at the outset of the semesters, and 3% of the population tested needed additional instruction. A lesson on geologic time using the *Decoding the Disciplines* methodology demonstrated use of the relative geologic time scale and enabled students to apply information on relative geologic time through the semester's lectures and activities. Further testing with the addition of geologic terms in a categorizing grid administered in the second week of the semester allowed students to practice the task correctly. Thus, early in the semester, knowledge and comprehension skills regarding these particular geologic terms and the concept of relative geologic time were emphasized for students in the class. Moreover, memorization and comprehension of the relative geologic time scale eras had occurred for the majority of the students at the completion of Exam 1, as 66% of the students knew the relative positions of the Paleozoic, Mesozoic and Cenozoic geologic eras. Exam 3 results, however, indicated that only 36% of students answered the relative placement of geologic time and biologic events correctly. The bottleneck on relative geologic time and associated biologic events remained firmly in place for 64% of the students at the end of the semester and one assumes that these students completed the class with incomplete knowledge of the relative geologic time scale for the Mesozoic and biological events pertaining to dinosaurs – the focus of the semester course. Our numerical analysis shows statistically significant results, and our hypothesis of equal facility of learning geologic time, and geologic time with associated biologic events by the end of the semester, was rejected.

In the case of our entry-level college course, we worked under the assumption that we were building on the principles expounded by the Benchmarks for Science Literacy – the foundational knowledge of dating the Earth and life that students bring to the college classroom. In assessing college level abilities at the end of the semesters' teaching, however, our findings indicate that more intentional interventions must be available to students if we expect them to accomplish the mental moves required to associate geologic time and biological events in the non-science majors undergraduate classroom. Our inquiry into the threshold concept of the geologic time scale thus uncovered a more deeply rooted issue of content knowledge, and the failed expectation of transfer of content knowledge from one level to the next. This is of course more basic than knowledge transfer as defined by Graham et al. (2006). It is, however, more closely related to learning transfer, a concept discussed extensively by Bransford et al (2000). The ability of students to organize information into conceptual frameworks is a key finding in the research on learning transfer (Bransford et al., 2000). In other words, competence in a field of inquiry initiates with factual knowledge, continues with an understanding of the facts in a conceptual framework, and is furthered with an organization of knowledge for retrieval and application (Bransford et al., 2000). These authors claim further that conceptual framing on the part of the student allows for greater learning transfer, and the "ability to plan a task, to notice patterns, to generate reasonable arguments and explanations, and to draw analogies to other problems are all more closely intertwined with factual knowledge than was once believed".

Our overall research results thus indicate that associating geologic time and biologic events remains a bottleneck and requires a paradigm shift. More frequent classroom activities as per *Decoding the Disciplines* methodology, followed by equally frequent classroom assessments, would allow students to practice the type of mental tasks required to transfer knowledge and comprehension of biological events located within a temporal geologic framework.

The exercises and exam questions presented in our research did not test for diachronic thinking skills - the ability to represent geologic transformations over time - that would be required for classroom discussions on complex topics such as dinosaur extinction. Cognitive factors that accounted for difficulties students encountered in attempting diachronic thinking were identified by Dodick and Orion (2003a). These researchers found that students could think in terms of tens, hundreds, and even thousands of years, but time became an abstraction when events that occurred millions or billions of years ago were presented; the enormous time scale was beyond students' comprehension. Researchers also observed that students tended to cluster strata into equal-sized packages and assign equal time to them, "…almost as if they were units on a ruler" (Dodick & Orion, 2003a, p. 436); in geology, however, the temporal duration of strata is rarely proportional to size. It was further noted that students did know how to use static or inert clues such as fossils and landforms to "visualize the dynamic processes of the past such as sedimentation," (Dodick & Orion, 2003a, p. 436). While our results show student scores for understanding of relative geologic time at the knowledge and comprehension levels of understanding, we do not address higher-order thinking skills that would be required for non-science majors to comprehend the complexities and significance of Earth's integrated physical, chemical and biological events – the transformations of geologic time as identified by Dodick and Orion (2003a). In future studies, however, geologic aptitude tests such as those developed by Dodick and Orion (2003b) would be excellent additions to assessment of student learning in the college classroom in introductory geology courses.

In summary, although our research results document difficulty students have with the learning of relative geologic time as related to biologic events in an introductory non-science majors course focusing on dinosaurs, we surmise that our research findings may be extended to more complex introductory geology courses that integrate biological, chemical and physical events within the context of both relative and absolute geologic time. Further, our findings are potentially applicable to fields outside of the geological curriculum. The teaching of evolutionary trees in biology requires a firm foundational understanding of the scaling of time (Meir, Perry, Herron, & Kingsolver, 2007). The spatial representation of time in an evolutionary tree is similar to the spatial representation of time that we performed in the methods of this study, wherein the older events may be portrayed at the bottom of the diagram and the younger events at the top. The medical field places great importance on timescales, as seen in disease processes and prognoses studied in epidemiology. There are various scales (e.g., date of diagnosis, date of recurrence, patient age) being used in epidemiological follow-up studies (Chubak, Yu, Buist, Wirtz, & Boudreau, 2013) that can impact the treatment plan of individuals as well as the statistical analysis of incident rates. Future healthcare professionals must be aware of and be able to navigate these various timescales. In sociological and philosophical studies, Lemke (2000; 2009) states that social-ecological systems "with all their many sublevels of organization" require an understanding of the lower organizational levels before trying to study the higher levels. This philosophy agrees with our research methods, in which students had to first understand the direction of geologic time before placing related biologic events on the time scale.

In essence, scaling issues are beyond students' common practices in numerous academic disciplines. Because of this shared experience, we suggest an intentional intervention to enhance student-learning that can be utilized across disciplines. This intervention is a hybrid model based upon our collective understanding and experiences of bottlenecks, threshold concepts and disciplinary ways of knowing, and is grounded in research recorded in the Decoding the

Disciplines model of Pace and Middendorf (2004). To begin the intervention, a bottleneck or threshold concept is introduced early in the semester, reinforced through student practice, and expanded upon through the semester with levels of increasing complexity. Modeling through metaphors is a crucial part of helping students learn a complex skill (Jones et al, 20100).

- Identify a bottleneck or threshold concept.
- Decode for the students the instructor's mental processes by breaking down the threshold concept into sub-components. (For details of the decoding process, see Pace & Middendorf, 2004).
- Model an example with use of metaphors relevant to the students.
- Present a student exercise and include challenging components that relate the threshold concept to the human experience.
- Assess student-learning from the exercise and address immediately misconceptions and errors. Reinforce the correct concept.
- Build on the threshold concept incrementally through the semester by modeling examples that construct the concept with increasing complexity.
- Continue to present students with practice exercises that emphasize the mental skills involved in developing the integrated complexity of the threshold concept.
- Assess student-learning and provide feedback frequently during the process, discuss misconceptions and errors, reinforce the corrections.

Although fostering content knowledge is a teaching goal in STEM education (Bao et al., 2009), clearly this objective was not achieved in our study, as evidenced by the test question results over a three-year study. "Because students ideally need to develop both content knowledge and transferrable reasoning skills, researchers and educators must invest more in the development of a balanced method of education, such as incorporating more inquiry-based learning that targets both goals" (Bao et al., 2009, p. 587). Whereas our primary goal was to better understand how students in a non-majors course apply timescales in a way that may vastly exceed their experience and knowledge, we conclude that further research into transfer of learning in many disciplines remains a fruitful avenue for investigation, especially as pertains to developing methodological approaches to teaching intervention, and assessment of both knowledge and transferable reasoning skills.

Acknowledgements

References

American Association for the Advancement of Science. (2009). *Benchmarks for science literacy*. New York, NY: Oxford University Press. Retrieved from http://project2061.aaas.org/tools/benchol/bolframe.html (Original work published 1993)

Angelo, T., & Cross K.P. (1993). *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). San Francisco, CA: Jossey-Bass.

Bao, L., Cai, T., Koenig, K., Fang, K., Han, J., Wang, J., Liu, Q., Ding, L., Cui, L., Luo, Y., Wang, Y., Li, L., & Wu, N. (2009). Learning and scientific reasoning. *Science, 323*(5914)*,* 586-587. doi: 10.1126/science.1167740

Bloom, B. S. (1964). *Taxonomy of educational objectives: The classification of educational goals, by a committee of college and university examiners*. New York, NY: Longmans and Green.

Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). (2000). *How people learn: brain, mind, experience, and school*. Washington, DC: National Academy Press.

Bransford, J.D., & Schwartz, D.L. (2001). Rethinking transfer: A simple proposal with multiple implications. *Review of Research in Education, 24*, 61-100.

Byrnes, J.P. (1996). *Cognitive development and learning in instructional contexts.* Boston, MA: Allyn and Bacon.

Catley, K. M., & Novick, L. R. (2009). Digging deep: Exploring college students' knowledge of macroevolutionary time. *Journal of Research in Science Teaching, 46*(3), 311-332. doi: 10.1002/tea.20273

Cheek, K. A. (2010). Why is geologic time troublesome knowledge? In R. Land, J.H.F. Meyer, & Baillie C. (Eds.), *Threshold concepts and transformational learning* (117-129). Rotterdam, The Netherlands: Sense Publishers.

Cheek, K. A. (2012). Students' understanding of large numbers as a key factor in their understanding of geologic time. *International Journal of Science and Mathematics Education, 10*(5), 1047-1069. doi: 10.1007/s10763-011-9312-1

Chubak, J., Yu, O., Buist, D.S.M., Wirtz, H.S., & Boudreau, D.M. (2013). Time scale in follow-up studies: Considering disease prognosis [Letter to the editor]. *Epidemiology, 24*(4), 628-629. doi: 10.1097/EDE.0b013e3182961708

DeLaughter, J. E., & Stein, S. (1998). Preconceptions about earth science among students in an introductory course. *EOS, ,79* 429-432. doi: 10.1029/98EO00325

Dodick, J., & Orion, N. (2003a). Cognitive factors affecting student understanding of geological time. *Journal of Research in Science Teaching, 40*, 415-442. doi: 10.1002/tea.10083

Dodick, J., & Orion, N. (2003b). Measuring student understanding of geological time. *Science Education, 87*, 708-731. doi: 10.1002/sce.1057

Graham, I.D., Logan, J., Harrison, M.B., Straus, S.E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *The Journal of Continuing Education in the Health Professions, 26,* 13–24. doi: 10.1002/chp.47

Johnson, C.C., Middendorf, J., Rehrey, G., Dalkilic, M.M., & Cassidy, K.

Hemler, D., & Repine, T. (2002). Reconstructing the geologic timeline. *The Science Teacher* 69(4), 32-35.

Jones, N. A., Ross, H., Lynam, T., Perez, P., & Leitch, A. (2011). Mental models: An interdisciplinary synthesis of theory and methods. *Ecology and Society, 16*(1), 46-46.

Lemke, J.L. (2000). Across the scales of time: Artifacts, activities, and meanings in ecosocial systems. *Mind, Culture, and Activity, 7*(4), 273-290. doi: 10.1207/S15327884MCA0704_03

Lemke, J.L. (2009). The long and the short of it: Comments on multiple timescale studies of human activity. *Journal of the Learning Sciences, 10*, 17-26. doi: 10.1207/S15327809JLS10-1-2_3

Libarkin, J. C., Kurdziel, J. P., et al. (2007). College student conceptions of geological time and the disconnect between ordering and scale. *Journal of Geoscience Education, 55*(5), 413-422.

MacKinnon, G. R. (2003). Why models sometimes fail: Eight suggestions to improve science instruction. *Journal of College Science Teaching, 32*, 430-433.

Meir, E., Perry, J., Herron, J.C., & Kingsolver, J. (2007). College students' misconceptions about evolutionary trees. *The American Biology Teacher, 69*(70), 71-76. doi: 10.1662/0002-7685(2007)69[71:CSMAET]2.0.CO;2

Meyer, J., & Land, R. (Eds.). (2006). *Overcoming barriers to student understanding: Threshold concepts and troublesome knowledge.* London and New York, NY: Routledge.

Middendorf, J., & Pace, D. (2004). Decoding the disciplines: A model for helping students learn disciplinary ways of thinking. In D. Pace & J. Middendorf (Eds.), *Decoding the Disciplines: Helping Students Learn Disciplinary Ways of Thinking: New Directions for Teaching and Learning, No. 98* (1-12). San Francisco, CA: Jossey-Bass.

Nieto-Obregon, J. (2001). Geologic time scales, maps, and the chronoscalimeter. *Journal of Geoscience Education*, *49*(1), 25-29.

Novak, G. M., Patterson, E. T., Gavrin, A. D., & Christian, W. (1999). *Just-in-time teaching: Blending active learning with web technology*. Upper Saddle River, NJ: Prentice Hall.

Pace, D., & Middendorf, J. (Eds.). (2004). *Decoding the Disciplines: Helping Students Learn Disciplinary Ways of Thinking: New Directions for Teaching and Learning, No. 98*. San Francisco, CA: Jossey-Bass.

Pyle, C. (2007). Teaching the time: Physical geography in four dimensions. *Teaching Geography 32*(3), 121-123.

Richardson, R. M. (2000). Geologic time (clothes) line. *Journal of Geoscience Education, 48*, 584.

Ritger, S. D., & Cummins, R. H. (1991). Using student-created metaphors to comprehend geologic time. *Journal of Geological Education, 39*, 9-11.

Thorndike, E. L., & Woodworth, R. S. (1901). The influence of improvement in one mental function upon the efficacy of other functions. *Psychological Review, 8*, 247-261. doi: 10.1037/h0074898

Trend, R. D. (1998). An investigation into understanding of geological time among 10- and 11-year-old children. *International Journal of Science Education, 20*, 973-988. doi: 10.1080/0950069980200805

Zen, E. A. (2001). What is deep time and why should anyone care? *Journal of Geoscience Education, 49*(1), 5–9.

Zhu, C., Rehrey, G., Treadwell, B., & Johnson, C. (2012). Looking back to move ahead: How students learn deep geological time by predicting future environmental impacts. *Journal of College Science Teaching, 41*(3), 61-66.

Assessing the impact of a short-term service-learning clinical experience on the development of professional behaviors of student physical therapists: A pilot study

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As with most health care provider education programs, physical therapy programs seek ways to develop professional behaviors of students. This study describes the integration of a one-week service-learning experience into an existing clinical internship. Quantitative and qualitative data were analyzed between groups of students who participated in the experience, expressed a desire to participate but were unable to, and those who did not wish to participate. Results suggest that engaging in, as well as the desire to engage in, a service-learning project for under-served members of our community is associated with professional behavior development from students' and clinical preceptors' perspectives.

Keywords: clinical education, professional development, professional socialization, core values, physical therapy, reflection

Introduction

Academic faculty and clinical preceptors have expressed concerns about student health care providers' professional behaviors (Carey & Ness, 2001; Jette & Portney, 2003). The question for physical therapist and other health care educators revolves around identifying effective teaching/learning methods for the development and enhancement of these behaviors. The purpose of this study was to determine the impact of a service-learning (S-L) activity, which involved providing physical therapy services to an underserved population in a multidisciplinary and non-traditional environment, on the development of professional behaviors of students. We hypothesized that engaging in the S-L experience would positively impact the development of professional behaviors of student physical therapists.

Review of Literature

Professional behaviors. Multiple descriptions are available for professionalism or professional behavior and concerns about professional behaviors of medical and health profession students are common (Arnold, 2002; Hammer, 2006; Jette & Portney, 2003). In her study of professionalism in physical therapy, Gleeson (2007) states it may include topics such as communication, loyalty, appropriate dress, and work habits. She further states that there may be differences in how professional behaviors are displayed across generations of physical therapists or students. Gersh (2006) reminds us that defining professionalism has been a difficult task for

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many disciplines, and that the recent focus in physical therapy has been on instilling these behaviors in our therapists and students. Professional behavior expectations for physical therapists can be found in the American Physical Therapy Association's (APTA) *Code of Ethics.* (APTA Code of Ethics, 2006). Definitions of the values and sample indicators of professionalism can be found in APTA's *The Core Values* document (APTA Professionalism, 2003). The seven values are 1) accountability, 2) altruism, 3) compassion/caring, 4) excellence, 5) integrity, 6) professional duty, and 7) social responsibility.

Hammer (2006) defines professional socialization as "the process by which students learn and adopt the values, attitudes, and practice behaviors of a profession" (page 3). Warren May and colleagues (1995) were leaders in identifying and measuring "generic abilities" of physical therapists. These abilities are "attributes, characteristics, or behaviors that are not explicitly part of a profession's core of knowledge and technical skills, but nevertheless are required for success in that profession" (page 3). The 10 abilities are 1) commitment to learning, 2) interpersonal skills, 3) communication skills, 4) effective use of time and resources, 5) use of constructive feedback, 6) professionalism, 7) responsibility, 8) commitment to learning, 9) problem solving, and 10) stress management. These abilities are modeled, versus taught, in academic curricula and are commonly reported as issues by preceptors.

Wolff-Burke (2005) reported that physical therapist preceptors, commonly referred to as clinical instructors within the physical therapy profession, expect students to demonstrate acceptance of responsibility for learning, professionalism, empathy, and appropriate communication skills. She also identified preceptors concerns about inappropriate behaviors by students in the clinic, such as demonstrating an attitude of disengagement or lack of interest, poor communication, and being unprofessional, and contends inappropriate behaviors in these areas might be termed "generic inabilities." In her study, eight out of 10 generic abilities were represented in the expected appropriate behaviors; problem solving and critical thinking were not identified. In addition, she found the Core Values of accountability, compassion and caring, and excellence were also expected by preceptors as appropriate behaviors.

Service-Learning. "Service learning is a structured teaching and learning experience that meets identified needs in the community with explicit learning objectives, preparation, and reflection" (Reynolds, 2009, page 3). Service learning can positively shape the students' understanding of their discipline as well as their knowledge about specific social issues with which they are involved. (Kahne & Westheimer, 1995). Seifer (1998) identifies five differences between service-learning experiences for health professions students and traditional clinical education: (1) service and learning are equal goals for the experience, (2) reciprocal learning occurs between the provider and receiver of services, (3) there is emphasis on citizenship and social change, (4) it emphasizes reflective practice, and (5) community partners identify their own needs. Providing services in non-clinical environments has been reported to be more effective in addressing learning of non-skill related objectives (Bringle & Hatcher, 1996; Seifer, 1998).

Providing direct care to underserved populations as a service activity is not novel (O'Toole, Kathuria, Mishta, & Schubert, 2005). Reynolds (2005) contends that cognitive theories support the use of service-learning as an educational tool and further describes clinical education as "a form of cognitive apprenticeship" (page 45). In her study, service-learning was effective in achieving objectives that are often difficult to address in traditional clinical education environments such as those related to professional development, social responsibility, awareness of individual and cultural differences, and application of prevention and wellness principles.

Reflection papers on a short-term service-learning experience demonstrated moderate to high reflections on professional behaviors (Reynolds, 2005).

Methods

Subjects. All second-year Doctor of Physical Therapy (DPT) students (N=35) at a university in Georgia were offered the opportunity to participate in a one-week S-L experience involving students and faculty from several health professions programs (nurse practitioner, nursing, pharmacy, physical therapy, and dental hygiene) across the state, working together in a non-traditional environment to provide health care services to itinerate farm workers and their families. The DPT students were informed that they would provide developmental screens at an elementary school for the farmworkers' children, and examination, evaluation, and intervention of primarily musculoskeletal problems for the adults at their "camps" upon their return from the day's work.

Students were asked to indicate whether or not they had a general interest in participating in this type of activity. More students expressed interested in participating in the experience than could be accommodated. Students who wanted to be considered wrote a short explanation of reasons for desiring to participate, how this experience fit into their long-term goals, and any special skills they brought to the activity. Seven students were selected based on multiple subjective factors including involvement in preparation leading up to the activity (such as collecting donations of clothing and toys), faculty members' desires to provide new opportunities for students, students who had Spanish language skills, and if their clinical setting could logistically be truncated into seven weeks from eight.

Three groups of students were now potential participants for inclusion in the study. One group indicated interest and participated (S-L group; n=7), another group indicated interest but did not participate (INT group; n= 12), and the final group did not indicate interest nor participate (N-INT group; n=16). The INT group was specifically identified in the study because the S-L activity was voluntary; willingness and desire to volunteer for such an activity was thought to possibly impact the findings. Therefore, for further analysis of the impact of the desire to participate in the S-L activity, a combined group (Combo) of the S-L and the INT groups was compared to the N-INT group.

Study Design. Approval to conduct the research was received from the physical therapy program's institutional IRB and the first author's institution of doctoral study. All members of the class (N=35) were invited to participate and all provided consent. This was a mixed-design, prospective study; the actual research question and tools for measurement were determined, based on the literature, prior to initiating the study. The service-learning activity and the clinical internship occurred independent of this study. Students who did not participate in the service-learning activity attended their assigned eight-week clinical internship. Students participating in the service-learning activity substituted the first week of their traditional eight-week clinical internship for the service-learning experience.

Instrumentation. Due to the subjectivity of measuring professionalism, several sources of assessment were used (Arnold, 2002; Parker, 2006). Quantitative data included two survey instruments, the Generic Ability Assessment (GAA) (May et al., 1995) and the Physical Therapist Clinical Performance Instrument for Students: Version 2006 (PT CPI) (Roach, Frost, Francis, Giles, Nordrum, & Delitto, 2012). Students and preceptors completed the surveys at midway (week 4) and at the end of the clinical experience (week 8). Qualitative data included a

student written reflection on communication/interpersonal skills at midterm and another on the Core Values at the end of the clinical experience. The outcome tools used midway and at the end of the clinical internship are shown in Table 1.

The GAA provides a three-point ordinal scale (beginning, developing, and entry-level) for assessment of ten behaviors associated with success in the profession (May et al., 1995). Instructions guided both the student and preceptors to circle the level most represented by the student's performance. The PT CPI allows self-assessment and preceptor assessment of a student physical therapist's abilities on 18 performance criteria. The performance criteria are grouped into the following 3 categories: "professional practice," "patient management," and "practice management." The professional practice criteria include specific performance assessments for six criteria, including safety, professional behavior, accountability, communication, cultural competence, and professional development (Roach et al., 2012). A rating scale of six defined anchors (beginning, advanced beginning, intermediate, advanced intermediate, entry-level, and beyond entry-level) require(d) meeting a specified achievement. For the purpose of this study, the professional practice category was included as the criteria within this category are similar to the generic abilities.

Two reflections (one at the midpoint and one at the end of the internship) were private exchanges via email from the students to the primary author, who served as the program's academic coordinator of clinical education (ACCE). The first reflection topic came directly from Plack's (2006) efforts to determine how student physical therapists learn communication and interpersonal skills. Students in her study and this study were asked to:

> "Think back, and provide a detailed description of an experience which helped you better understand and ultimately develop the communication and interpersonal skills essential to being a physical therapist. This incident can be either positive or negative and should be particularly meaningful to you as an individual" (page 39).

The second reflection topic was related to the APTA's Core Values:

> "Review APTA's Core Values (including definitions and sample indicators). Think back on the entire 8 weeks of Clinical Internship III. Describe a situation that has most impacted you as a future physical therapist in relationship to <u>one</u> of the Core Values. Clearly identify the Core Value, provide a detailed description of the situation and how it has shaped you as a future physical therapist. "

Data Collection and Quantitative Coding Procedures. Materials for this study were collected as part of the established process of the course. Data were key coded and identifying information removed for the purpose of analysis. Analysis occurred after grades were posted.

Data Analysis. Quantitative data were analyzed using the statistical software package SPSS Version 17 (SPSS, 2008). Kruskal-Wallis tests were performed and descriptive statistics were computed on the three groups' ordinal data; an alpha level of 0.05 was set. The Mann-Whitney U tests were used to analyze specific sample pairs for significant differences. Data from combining the S-L and INT group to compare to the N-INT group were analyzed by Mann-Whitney U tests with an alpha level set at 0.05.

The qualitative data (midterm reflections) were analyzed using a grounded theory approach and assessed to determine themes and subthemes from the data with subsequent coding of each reflection (Hesse-Bieber & Leavy, 2006). Two reviewers independently read the reflections and developed a draft coding framework from the data. Two subsequent meetings lead to identification of major themes and subcategories within the midterm reflection data. Reviewers then read the data again, coded the data, and compared and discussed until consensus

was reached. Final reflections were assessed for the specific clinical situation and Core Value identified by the student.

Table 1

Outcome Tools

Outcome Tool	Quantitative Data	Variables or Constructs	Qualitative Data
Generic Ability Assessment (GAA) Completed by student and preceptor at end of week 4 and week 8	3 point ordinal scale 1= Beginning 2=Developing 3=Entry-level	1.Commitment to learning 2. Interpersonal skills 3. Communication 4. Use of constructive feedback 5. Effective use of time or resources 6. Problem solving 7. Professionalism 8. Responsibility 9. Critical thinking 10. Stress management	
The Professional Practice Criteria of the Physical Therapist Clinical Performance Instrument for Students (PT CPI) Completed by student and preceptor at end of week 4 and week 8	10 point ordinal scale via radio bullets with defined anchors. 0= beginning 2=adv. beginning 4= intermediate 6=adv. intermediate 8=entry-level 10=beyond entry-level	1. Safety 2. Professional Behavior 3. Accountability 4. Cultural Competence 5. Communication 6. Professional Development	
Student Reflections Completed by student at week 4 (midpoint) and week 8 (final)			Midpoint: an experience which helped you better understand and ultimately develop the communication and interpersonal skills essential to being a physical therapist Final: a situation that has most impacted you as a future physical therapist in relationship to one of the Core Values

Results

Quantitative. Mean scores from the GAA from students and preceptors at midterm and final are displayed on Table 2. Assessment of students' scores on the ten categories of the GAA, and a total summed score revealed one difference. Self-assessments of *Interpersonal Skills* at the end of the eight-week clinical experience were different (p=.018) between the 3 groups, with the N-INT group scoring the lowest with a mean of 2.25. There was no difference between the S-L and INT groups (means were 2.71 and 2.75, respectively). Further assessment of the combined group (2.74) to the N-INT group (2.25), demonstrated that the difference remained (p=.005).

Assessment of preceptor's ratings on the GAA identified other differences. Midway through the clinical experience, *Effective Use of Time and Resources* differed between the three groups (p=.031), with the N-INT group scoring lowest (1.81). Again, there was no difference between the S-L and INT groups whose means were 2.14 and 2.25, respectively. The S-L and INT groups were collapsed for additional analysis (p=.010). At the final assessment (week 8), additional differences were identified between the two groups, including lower scores given to the N-INT group for *Commitment to Learning (p=.019)* and *Critical Thinking (p=.031).* Summed final scores of the GAA revealed differences between the 2 groups for student (p=.040) and preceptor (p=.036) assessment, where, again, the N-INT scored lower. The preceptors also provided five instances of mean scores of 3, the highest possible, to the S-L group for *Commitment to Learning, Interpersonal Skills, Constructive Feedback, Professionalism*, and *Responsibility.* Neither the INT or N-INT group received this optimal score.

The CPI data demonstrated no differences between the groups for mid-point or final scores on the constructs of Professional Practice. All students were scored at the intermediate level (minimum score of 4) at the conclusion of the eight week clinical internship via self and preceptor assessment.

Anderson, J.R., Taylor, L.F., & Gahimer, J.E.

Table 2

Mean Scores from the Generic Abilities Assessment

	Student Midterm				Student Final				Preceptor Midterm				Preceptor Final			
	S-L	INT	N-INT	Comb	S-L	INT	N-INT	Comb	S-L	INT	N-INT	Comb	S-L	INT	N-INT	Comb
Commitment to Learning	2.14	2.50	2.19	2.37	2.57	2.75	2.44	2.68	2.29	2.75	2.38	2.58	3.00	2.91	2.63	2.95*
Interpersonal Skills	2.29	2.33	2.06	2.32	2.71	2.75	2.25*		2.43	2.50	2.25	2.47	3.00	2.83	2.63	2.89
							2.25	2.74**								
Communication	2.14	2.17	2.00	2.15	2.57	2.33	2.31	2.42	2.14	2.33	2.31	2.26	2.85	2.67	2.63	2.74
Effective Use Time/Resources	2.00	2.00	2.00	2.00	2.42	2.50	2.19	2.47	2.14	2.25	1.81*		2.57	2.75	2.50	2.68
											1.81	2.21**				
Use Constructive Feedback	2.14	2.17	2.19	2.16	2.71	2.41	2.38	2.53	2.57	2.58	2.44	2.58	3.00	2.83	2.63	2.89
Problem Solving	2.00	2.17	2.00	2.11	2.14	2.33	2.19	2.26	2.00	2.00	1.88	2.00	2.43	2.50	2.25	2.47
Professionalism	2.29	2.58	2.62	2.47	3.00	2.83	2.75	2.89	2.57	2.75	2.63	2.69	3.00	2.91	2.81	2.95
Responsibility	2.42	2.33	2.13	2.37	2.57	2.58	2.31	2.58	2.42	2.50	2.31	2.47	3.00	2.75	2.62	2.84
Critical Thinking	2.14	2.00	2.06	2.05	2.14	2.17	2.19	2.16	2.14	2.17	2.00	2.16	2.71	2.67	2.31	2.68*
Stress Management	2.29	2.58	2.50	2.47	2.43	2.83	2.69	2.68	2.14	2.67	2.43	2.47	2.57	2.91	2.69	2.79
Total Score	21.86	22.83	21.75	22.47	25.29	25.50	23.50	25.42*	22.86	24.50	22.43	23.89	28.14	27.75	25.69	27.89*

*p<.05, **p<.01

Qualitative. Midterm Reflections. Four main themes (refer to table 3) emerged from the midterm student reflection papers on an experience that helped them understand and develop communication/interpersonal skills essential for being a physical therapist: 1) establishing a therapeutic relationship, 2) the importance of educating patients, 3) assertive communication situations, and 4) student introspection.

Table 3

Midterm Reflection Themes and Subcategories

Main Themes	General Definition	Subcategories
Therapeutic Relationship	Identifies situations related to establishing a therapeutic relationship	Patient is center, but therapist controls situation: -reaching patient -connection -gaining trust -establishing rapport -allowing patient to say their piece -active listening -affirm/validate
		Dealing with patient emotions or demonstrating compassion/caring/empathy
		Non-verbal behaviors
Education	Identifies situations related to the importance of education	Strategies of teaching and patient learning for: -understanding -adherence
		Effectiveness of teaching treatment
Assertive Communication	Identifies situations related to assertive communication	Confidence/assertiveness related to education/treatment
		Defending self and/or profession to others
		Lack of assertive communication
		Difficulty of assertive communication
Student Introspection	Demonstrates introspection of student's role	Regarding feeling positive for future success
		Regarding their need for change/development

The students in the S-L group described experiences in which establishing a therapeutic relationship was the most important for their understanding and developing the communication and interpersonal skills essential to being a physical therapist. Establishing a therapeutic relationship was described twice as often for this group as the next most commonly described experiences, which related to introspection. None of these students identified experiences that occurred during the S-L activity as the ultimate in shaping their communication and interpersonal skills. In contrast, students in the INT group described experiences related to assertive communication. Introspection on their own performance occurred similar to that of the S-L group. More than half of their reflections included therapeutic relationship themes. The students in the N-INT group had the fewest examples of introspection on their communication and interpersonal skills; rather, the emphasis was on education and focused more on technical and/or procedural aspects of improving patient/client experiences and outcomes.

Qualitative. Final Reflections. Refer to the Appendix for examples of student reflections, and to Table 4 for the percentage of students identifying a specific core value as related to a situation that had the most impact on their development as a future physical therapist. As noted in the research by Wolff-Burke (2005), the students in the INT and N-INT groups indentified situations related to the core value of *Compassion and Caring* most often. Ten of 11 students in the INT group identified situations that related to *Compassion and Caring* and over two-thirds of the students in the N-INT group identified situations related to *Compassion and Caring*. Of the 7 students in the S-L group, over half described a situation related to *Altruism* that most impacted them as a future physical therapist. Nearly three-quarters of those students specifically mentioned the S-L activity as the one experience that impacted them the most. One student's response in the INT group was not considered in the analysis as the reflection included examples of how all the core values were demonstrated and influential.

Table 4

APTA Core Value Identification of Final Reflections

Percentage of Students Who Identified Specific Core Value as Most Influential			
	S-L group	INT group[*]	N-INT group
Accountability		8%	
Altruism	57%		25%
Compassion/Caring	29%	83%	69%
Excellence			
Integrity			6%
Professional Duty			
Social Responsibility	14%		

*One student's reflection removed from consideration as all values mentioned as influential.

Discussion and Conclusion

This study considered the impact of including a one-week service-learning clinical experience in a non-traditional setting, as an adjunct to the traditional clinical internship, on the development of professional behaviors of doctor of physical therapy students. During the traditional clinical internship, students who participated in the S-L activity, those who were interested, and those who were not interested, all demonstrated the expected and required levels of professional behaviors for success in the course. Students who replaced one week of the traditional internship with this S-L activity, or who simply desired the opportunity to participate, rated their own professional behaviors at a higher level than those who were not interested in the activity. This was also supported by preceptor ratings of the students' professional behaviors.

Reflection may be the key to understanding why the S-L and INT groups had higher self-assessment and preceptor ratings on the GAA. Cruess and Cruess (2006) state that opportunities for self-reflection allow for internalization of values. They further support providing students a variety of experiences and role modeling opportunities. Certainly this service-learning activity was unique to what other students experienced; further, role modeling of altruism by multidisciplinary faculty members was apparent.

Clinical preceptors' higher ratings of the S-L students' professional behaviors on the GAA in this pilot study is consistent with the previously reported data on the effectiveness of service-learning on the development of professional behaviors (Reynolds, 2005). The definition of *Commitment to Learning* includes "the ability to self-assess, self-correct, and self-direct" which would require the ability to reflect. The S-L group had the highest possible ratings of this ability from clinical preceptors (a mean rating of 3 out of 3). This was also consistent with the higher percentages of student introspection in the mid-term written statements for the S-L and INT groups.

There is debate in the literature about whether *Critical Thinking* is a sign of professional behavior. While preceptors in Wolff-Burke's (2008) study did not identify *Critical Thinking* as a professional behavior, CIs and students in May and colleagues (1995) and Jette and Portney's (2003) studies support the inclusion of this trait as part of professionalism. The combined group in our study received higher final scores by their preceptors of this behavior. Students who participated in the S-L experience were exposed to difficult clinical cases and limited availability of intervention options; critical thinking should have been challenged by the service-learning experience. This appears to have transferred over to, or been reinforced in, their performance in the traditional clinical environment. Further, the definition of this skill includes "the ability to question logically" which would require reflection on the problem at hand.

Midterm reflections revealed a difference in the types of experiences the three groups of students perceived as most valuable to developing their communication and interpersonal skills. Students in the S-L group recalled experiences related to establishing a therapeutic relationship. Students in the INT group most often reported situations that dealt with their feelings about the challenges or successes interacting with others in an assertive manner. These reflections corroborate both groups' higher ratings on the interpersonal skills category of the GAA. There are many similarities to the GAA descriptors for interpersonal skills and the reflections. For the S-L group, this relates to Johnson and colleagues (2006) findings that student reflections on their interpersonal communication improved after working in pro bono clinics.

Further, overall reflection on performance was most common for the students in the S-L group, which is consistent with the findings on the self-assessment and preceptors' assessment of student performance on the CPI. Plack (2006) believes that dialogue creates shared meaning and subsequent professional identity. During participation in the service-learning activity, the students engaged in daily interdisciplinary reflection. Reflections from the S-L group on their own performance were similar to those interested in participation (INT group) but more prevalent than those who were not interested in participating.

Research supports S-L in non-clinical settings for health professions students, so as to avoid emphasis on profession-specific cognitive and psychomotor skills (Bringle & Hatcher, 1996; Seifer, 1998). This experience occurred in a unique clinical environment in a non-traditional setting with an underserved population. Replacing one-week of the students' 8-week clinical time appeared to be influential in regard to developing professionalism as defined by the physical therapy profession's core values. This experience was clearly service-learning as students learned about the living and working environments of the patients/clients, their health disparities and available health care resources, and roles of other health care professionals. In particular, the values of *Altruism* and *Social Responsibility* were evident in their reflections, and were not identified by the other students. Reynolds (2009) states that volunteerism and community service "arouse a powerful sense of altruism that can be easily expressed (page 4)."

Limitations. The DPT students who participated in the S-L activity were chosen by 2 faculty members, one of whom was the Academic Coordinator of Clinical Education (ACCE) and the primary author of this paper. The other faculty member had no interaction or participation in this study. The selection criteria could have been biased toward those students who might already be more sensitized to community service. However, it also important to remember that the feasibility of their clinical internship was equally, or more, significant in the selection process. All 35 students were eligible to go; no student was in academic jeopardy. The addition of comparing two groups (those who attended or were interested in attending to those who did not wish to participate) strengthens the validity of the analysis. Certainly the sample size is of concern; however, it was one of convenience based on a clinical and academic reality, and was appropriate to the question. This study is investigatory; triangulation of data was performed to strengthen the validity of the findings.

Future Research. Health professions programs must not only train future practitioners in clinical skills, but also in professional behaviors. Participation in service-learning appears to develop both clinical skills and professional behaviors while also playing an important role within the community. Further studies, with larger groups of students in a variety of health care programs would add to the validity of the findings of this study. An unexpected finding is that it appears there is a positive relationship between students' perceived professional behaviors and just having a desire to participate in S-L activities. Continued research into whether these behaviors are inherent or whether they are learned or nurtured by participating in the actual activity may be the most appropriate question. Application of outcomes could assist in interviewing students for traits that could be helpful in determining future clinical success. Integration of service-learning pedagogy into the curricula of healthcare programs may benefit the practitioner and ultimately those individuals with whom we are privileged to serve.

Acknowledgements

Appendix

Appendix 1: Examples of Qualitative Data

S-L #3: "I could feel his depression just sitting in the air. … I made sure to make him as comfortable as possible and try to put him at ease. I asked open ended questions until he was talking a little more freely. I used all of the skills we learned in psychosocial class to affirm and validate what he was telling me. … I tried to communicate verbally and nonverbally with my body language that I sympathized with his situation. … I made sure to let him know that he was always in charge, …" (Therapeutic Relationship)

INT #14: "I was obviously upset. I had let my feeling of being inferior as a student to a professional get in the way of making what I knew to be the right decision. …it was a learning experience for me to have enough confidence in myself to speak out when I think something is wrong. At the end of the experience this may be the biggest lesson that I will have learned." (Assertive Communication)

N-INT #15: "Now came the hard part, trying to explain to the patient what was going on in her body. I started off trying to explain… she may have stretched the nerves…. I could tell by the blank stare that was giving me that she really did not understand what or how what I was telling her could be causing her symptoms.   I brought over the model of the spine, …She started to understand a little more,… I then took her over to the poster we have of the nervous system…Now I had to explain why her body was not allowing her to move her arms in certain directions, and how I was going to help her.   This process took a lot of time, but at the end she understood this and it started to make sense to her.   I ended up spending a lot more time educating the patient her first session than I expected…" (Importance of Education)

S-L #3: "XXX is exactly what altruism describes. … We were able to put those patients' needs above our own.   As physical therapist we usually need things like, bright light so we can see, air conditioning mostly for comfort, no bugs also for comfort, and sensible working hours. In XXX that was not going to happen. We wanted to help these people so that's what we had to put up with; little light, heat, bugs, and late long hours. …Last year when I had to write about altruism I couldn't imagine how PTs would do pro-bono work and now I have a fantastic example of it. " (Altruism)

INT #14: "I believe I was successful in the acute care setting because my compassion and caring was evident to each of my patients. …After meeting her for the first time, I had a good read of what she liked, and would bring her a hot cup of coffee to wake her up and motivate her consent to treatment. During our walk, I listened as she talked about her children and her life as a young girl. … Each day before I left her room, she would say, 'I have just one more thing to say. Thank you for being you. I love that smile you have, it always makes me feel so good. You know that not everyone treats an old woman the way that you do, allowing me to make my own decisions and not commanding me to do things. " (Compassion/ Caring)

References

American Physical Therapy Association. (2003). *Professionalism in physical therapy: Core values.* Retrieved October 31, 2009 from http://www.apta.org/documents/public/education/professionalism.pdf)

American Physical Therapy Association (APTA). (2006). *Code of Ethics*. Retrieved October 30, 2009 from http://www.apta.org/uploadedFiles/APTAorg/About_US/Policies/HOD/Ethics/Codeofethics.pdf.

Arnold, L. (2002). Assessing professional behavior: Yesterday, today, and tomorrow. *Academic Medicine*, *77*(6), 502-515. doi: 10.1097/00001888-200206000-00006

Bringle, R., & Hatcher, J. (1996). Implementing service learning in higher education. *Journal of Higher Education*, *67*(2), 221-238. doi: 10.2307/2943981

Carey, J., & Ness, K. (2001). Erosion of professional behaviors in physical therapist students. *Journal of Physical Therapy Education*, *15*, 20-22.

Cruess, R., & Cruess, S. (2006). Teaching professionalism: General principles. *Medical Teacher*, *28*(3), 205-208. doi: 10.1080/01421590600643653

Gersh, M. (2006). Servant-leadership: A philosophical foundation for professionalism in physical therapy. *Journal of Physical Therapy Education*, *20*, 12-16.

Gleeson, P. (2007). Understanding generational competence related to professionalism: misunderstandings that lead to perception of unprofessional behavior. *Journal of Physical Therapy Education*, *21*, 23-28.

Hammer, D. (2006). Improving student professionalism during experiential learning. American *Journal of Pharmaceutical Education*, *70*(3) Article 59, 1-6.

Hesse-Biber, S. H., & Leavy, P. (2006). *The Practice of Qualitative Research*. Thousand Oaks, CA: Sage Publications, Inc.

Jette, D., & Portney, L. (2003). Construct validation of a model for professional behavior in physical therapist students. *Physical Therapy*, *83,* 432-443.

Johnson, M., Maritz, C., & Lefever, G. (2006). The Mercy Circle of Care: An interdisciplinary, multi-institutional collaboration to promote community health and professional education. *Journal of Physical Therapy Education*, *20*, 73-79.

Kahne, J., & Westheimer, J. (1996). In service of what? The politics of service learning. *Phi Delta Kappan. 77,* 593-599.

May, W., Morgan, B., Lemke, J., Karst, G., & Stone, H. (1995). Model for ability-based assessment in physical therapy education. *Journal of Physical Therapy Education*, *9*(1), 3-6.

Seifer, S. (1998). Service-learning: Community-campus partnerships for health professions education. *Academic Medicine*, *73*, 273-277. doi: 10.1097/00001888-199803000-00015

O'Toole, T., Kathuria, N., Mishra, M., & Schukart, D. (2005). Teaching professionalism within a community context: Perspectives from a national demonstration project. *Academic Medicine*, *80*(4), 339-343. doi: 10.1097/00001888-200504000-00006

Parker, M. (2006). Assessing professionalism: Theory and practice. *Medical Teacher*, *28,* 399-403. doi: 10.1080/01421590600625619

Plack, M. (2006). The development of communication skills, interpersonal skills, and a professional identity within a community of practice. *Journal Of Physical Therapy Education*, *20*(1), 37-46.

Reynolds, P. (2005). How service-learning experiences benefit physical therapist students' professional development: A grounded theory study. *Journal of Physical Therapy Education*, *19*(1), 41-54.

Reynolds, P. (2009). Community engagement: What's the difference between service-learning, community service, and community-based research? *Journal of Physical Therapy Education*, *23*(2), 3-9.

Roach, K., Frost, J., Francis, N., Giles, S., Nordrum, J., & Delitto, A. (2012). Validation of the Revised Physical Therapist Clinical Performance Instrument (PT CPI): Version 2006. *Physical Therapy*, *92*, 416-428. doi: 10.2522/ptj.20110129

SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc. Wolff-Burke, M. (2005). Clinical instructors' descriptions of physical therapist student professional behaviors. *Journal of Physical Therapy Education*, *19*, 67-76.

The delivery of recreation programs: Students gain entry level management skills through service learning

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Abstract: Service learning is a well established pedagogy within higher education. Specifically, service learning allows students to engage in 'real world' activities to practice skills and reflect upon their own competence. To enhance the effectiveness of service learning, instructors need to consider a multitude of learning influences. This study adhered to the tenants of the Social Cognitive Theory (Bandura, 1986; Schunk, 2004) to engage students enrolled in a 2000 level recreation program development course in service learning activities related to entry level administrative competencies. Data analysis included a content analysis of reflection papers (n=186) to determine how many times competencies expected of entry level recreation professionals were mentioned. Students perceived the acquisition of competencies consistent with entry level competencies identified within the recreation industry. Findings contribute to the development of effective assignments to facilitate the acquisition of desired professional competencies.

Keywords: pre-service competencies, recreation management, recreation planning, program planning, service-learning, recreation education.

Introduction

The recreation industry is a varied field that includes many types of agencies and clientele with which professionals may work. Graduates of recreation administration degree programs often work in settings such as public/government recreation agencies (i.e. park and recreation departments), non-profit service agencies, commercial organizations (i.e. fitness centers and special event planners), and therapeutic agencies serving people with disabilities. Thus, recreation educators are challenged to provide experiences that will prepare students with competencies to meet this broad arena of opportunity.

With such a varied career potential, determining a core set of expectations for new professionals could be daunting. The Council on Accreditation of Parks, Recreation, Tourism and Related Professions (COAPRT) via the National Recreation and Park Association (NRPA) accredits undergraduate programs in parks, recreation, tourism, sport management, event management, therapeutic recreation and leisure studies. This accreditation program offers some direction when it comes to understanding what competencies students should obtain in order to be successful in the recreation industry. According to COAPRT standard 7.01:

> Students graduating from the program shall demonstrate the following entry-level knowledge: a) the nature and scope of the relevant park, recreation, tourism or related professions and their associated industries; b) techniques and processes used by

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professionals and workers in these industries; and c) the foundation of the profession in history, science and philosophy (COAPRT, 2014, p.13).

The research reported in this paper focused on part b of standard 7.01 which requires students to demonstrate "techniques and processes used by professionals and workers in these industries" (COAPRT, 2014, p. 13). As such, we looked to identify specific skills or competencies used by professionals in the recreation industry.

Existing research on competency includes skills, knowledge and characteristics related to success in employment responsibilities (Hurd, 2004b). To date, recreation related literature includes identified competencies associated with agency CEOs (Hurd & Buschbom, 2010; Hurd & McLean, 2004), entry level professionals (Hammersley & Tynon, 1998; Hurd, 2005), and sport administration personnel (Barcelona & Ross, 2004; Jamieson, 1987). In addition, Hurd, Barcelona & Meldrum (2008) confirmed a list of competencies that are needed by an entry level recreation professional.

The research examining competencies needed by entry-level professionals identified 40 different competencies in six categories (Hurd et al., 2008). The categories are business acumen, communication, community relations, interpersonal skills, management techniques, and planning and evaluation. Refer to Appendix 1 for specific competencies in each of the identified categories.

Although established entry level competencies exist, according to Barcelona, Hurd, and Bruggeman (2011) there is uncertainty about the best pedagogical method to develop these competencies. According to Olsen and Burke (2014), "the challenge is not teaching the concepts … but rather in developing undergraduate students' … skills through instruction and practical application of the theories and strategies" (p. 76) as presented in textbooks. Further, Crossley, Jamieson, and Brayley (2007) suggest that some personal attributes and skills needed by professionals in the recreation industry are difficult to teach via traditional academic methods such as lecture. "As recreation is predominately a leisure activity, learning how to plan and implement … [activities] or program[s] cannot be done through theoretical classes alone" (Coetzee, Hermanus, Bloemhoff, & Luzelle, 2011, p. 549). Thus a popular approach is the inclusion of service learning experiences within academic courses, where students have reported perceived achievement of a-priori competencies through service learning (Coetzee et al., 2011). This is supported by comments from an Athletics Supervisor for a city parks and recreation department who works with undergraduate students on service-learning projects:

> Unfortunately, the current job market is not what I would refer to as an ideal opportunity for college graduates. Competition for entry level supervisors has increased considerably over the past five years. College graduates need relevant experience to complement their degree. In addition, interview questions are typically going to focus on the practical application of service delivery rather than a theory based approach. It is essential that graduates bring practical experience to interviews and this [service learning] project ultimately makes them more marketable as a prospective employee (Werner, 2011).

Service Learning and Recreation Education

Bringle and Hatcher (1997) define service learning as a:
type of experiential education in which students participate in service in the community and reflect on their involvement in such a way as to gain a further understanding of

course content and of the discipline and of its relationship to social needs and an enhanced sense of civic responsibility (p. 153).

Within the recreation literature, Stevens (2008) suggests that "service learning is a hands-on class project in which you learn by helping others, discover how class knowledge is useful in the real world, master practical skills … and gain an appreciation for diversity" (p.xii). As a teaching method within the field of recreation, service learning is by no means a new concept. However, research on the outcomes of service learning in recreation programs appears to be limited. A literature search of the primary journals in recreation and leisure studies revealed fewer than two dozen articles that included the key words of both service learning and recreation education or recreation. Examples include reports on various types of community-based projects: (Cucina & McCormack, 2001; Hendricks & Miranda, 2003; Moorman & Arellano-Unruh, 2002; Mumford & Kane, 2006; Ostiguy & Hopp, 1995; Petersen, Judge, & Pierce, 2012; Riley, 2006; Smith, 2003); articles about the use of journals and the reflection process (Baccarro, 2003; Coetzee et al., 2011; Cooke & Kemeny, 2014; Olsen & Burk, 2014); the use of students as peer advisors (Stringer & Kowalski, 2003); and two which seemed to focus more on the process and outcomes of service learning (Ruan, Edginton, Chin, & Mok, 2014; Williams & Lankford, 1999).

In regard to the importance of service learning to academic preparation of new professionals, a Recreation Division Manager, for a city parks and recreation department commented:

As a student coming out of a program where service learning was important I not only felt prepared to do my job, I also felt confident that I was given every opportunity in my education to gain all necessary skills to make me ready. As a professional in the field of parks and recreation … I have also had the opportunity to work with students coming out of a different university program where service learning is not emphasized and I see the difference in their abilities and readiness to perform the tasks of planning and executing a program or special event. The service learning aspect of classes allows the students to get firsthand experience working with agencies in the community, thus building skills as well as community relationships between the university and its surrounding cities and towns. I feel that service learning is not only necessary for true growth of a student; I feel it is essential for students to be prepared to go into the real world (Flores, 2011).

Although literature about service learning specific to recreation administration curriculum is scant, numerous studies in other disciplines have demonstrated its effectiveness. According to Sax and Astin (1997) participation in service learning leads to increased knowledge in that student's discipline. Examples supporting this statement were found in teacher education (Meaney, Housman, Cavazos, & Wilcox, 2012; Meaney, Griffin, & Bohler, 2009), journalism (Cohen & Kinsey, 1994), human organizational development (Giles & Eyler, 1994), and health education (Housman, Meaney, Wilcox, & Carazos, 2012). In addition to discipline specific literature related to service learning, there were numerous other articles related to the moral and character development of students (Batchhelder & Root, 1994; Bernacki & Jaeger, 2008; Reed, Jernstedt, Hawley, Reber, & DuBois, 2005), increases in civic responsibility and intentions to participate in community service (Astin & Sax, 1998; McCarthy & Tucker, 2002); as well as changes to a students' global perspective, or their tolerance towards groups with which they normally did not interact (Engberg & Fox, 2011; Morgan & Streb, 2001).

Based on the available literature in recreation, there appears to be a limited amount of research connecting service-learning to specific competencies and skills regarded as necessary in the field of recreation (Coetzee et al., 2011; Olsen & Burk, 2014) and neither of those is tied to a

theoretical framework beyond the accreditation standards set forth by The Council on Accreditation of Parks, Recreation, Tourism and Related Professions (COAPRT). Therefore, the purpose of this study was to explore which competencies students would perceive as achieved through participation in a service learning project, designed according to the indices of the social cognitive theory. This was a descriptive study with a content analysis based on a series of students' reflection papers in an undergraduate recreation class with a required service learning component.

Theoretical Framework

The impact of service learning on students' ability to understand and apply the principles related to developing, implementing and evaluating a recreation program can be explained by aspects of the Social-Cognitive Theory (SCT). Bandura (1986) suggests that SCT explains human functioning as the interaction of internal personal factors, behavioral patterns and environmental influences. According to Schunk (2004), a recognized scholar in educational learning theories, SCT is a theory about observational learning that enhances the acquisition and performance of competencies, where learning is contingent on the social environment.

A principle tenet of SCT involves the concept of triadic reciprocal determinism that suggests changes in behavior occur because dynamic social settings promote interactions between one's personal factors, environment, and behavior (Schunk, 2004). Figure 1 represents how the factors of SCT interact. Personal factors may include a learner's knowledge, perceived self-efficacy, behavioral capacity, outcome expectations, fears, and goals related to a given social situation (Housman et al., 2012). According to Schunk, the environment includes any social, economic, policy, legal, or physical influence that can act on behavior including learning new skills, autonomy, and persistence.
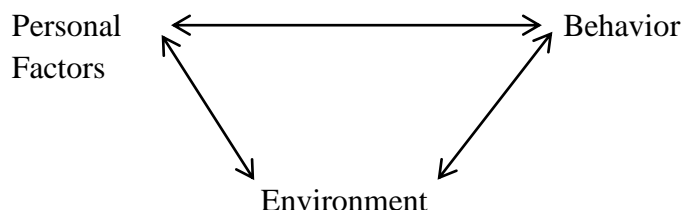

Figure 1. A model illustrating the interactive factors of Social Cognitive Theory (SCT). Schunk 2004.

Although SCT has not been used as a framework to understand learning in recreation degree programs, it has been effectively used in other disciplines. For example, Housman et al. (2011) used SCT to demonstrate how students in a health education program improved perceived self-efficacy as well as cultural competence through participation in a service-learning project. In addition, Meaney has conducted research with both undergraduate (Meaney, Griffin, & Bohler, 2009) and graduate (Meaney et al., 2012) pre-service physical education majors using an SCT framework.

According to SCT, to best understand how students learn it is imperative to consider the full range of the environment where students are engaged in learning activities (Schunk, 2004).

Therefore in a course with a service learning component, the classroom as well as the service learning environment must be considered. For the purposes of this study, the environment in the context of the service learning project includes the type of agency to which the students are assigned, the clientele and the agency representatives with whom the students work. The behavior in this study refers to skill acquisition, namely the competencies which students perceived they utilized or gained. According to SCT, personal student factors combined with the environment result in behavior (Schunk, 2004).

Methods

This study occurred over two academic semesters involving student reflection about their learning as related to participation in a service learning project to plan and deliver a recreation program. The Social-Cognitive Theory (SCT) model guided the planning of service learning projects to achieve desired learning outcomes. Two specific issues were influenced by SCT: 1) the instructor specifically sought out projects from a variety of recreation agencies which served different types of clientele so as to have a varied environment; and 2) the instructor intentionally included questions in each reflection paper that related to SCT. This approach allowed for rich description attained from the words of students prior to, during, and after their service learning experience.

Participants

Participants were enrolled in a recreation program development course at a state university in the southwest United States. It is a 2000 (sophomore) level class restricted to recreation majors and minors that requires 2 prerequisite courses in the recreation administration degree program prior to enrollment. Due to these prerequisites, students were not eligible to take this course until at least their second semester in the program. In the fall semester 28 students (11 male, 17 female) worked with eight special events. The age range of the students was 19-31 years with an average age of 22.86. In the spring semester, 35 students (18 male, 17 female) were assigned to nine special events. The age range of the students was 20-51 years with an average age of 23.83. All students enrolled in the course were required to participate in the service learning component as a graded portion of the course. Permission from the University Human Subject's Review Board was obtained prior to data collection.

The Service Learning Project

Prior to each semester the instructor worked with a variety of local recreation providers, such as park and recreation departments, local housing authority, and private nonprofit disability services agencies, to organize the service learning assignment. Agency supervisors were provided a written description of the project requirements (students needed to help design, implement and evaluate a special event) prior to agreeing to participate. In addition, agency supervisors could assign tasks and deadlines relating to the event beyond the course requirements if necessary for the success of the event. Agency supervisors were asked to serve as mentor, guide, and supervisor for one or more events. The agency supervisor decided for which events they were willing to accept student groups, and determined how many students could be utilized

appropriately for a particular event. In each semester there was a mix of public agencies offering free programs, public agencies offering programs for which participants paid an entry fee, and nonprofit agencies offering free programs.

At the first class meeting of the semester, students received a list of agencies, events, and dates. On the third class day, agency representatives attended class to share additional information regarding their specific events such as target market and an overview of the student work tasks. Following these presentations, each student rank-ordered their top four event preferences. The instructor then used these ranking sheets to assign three-five students to each event.

During the semester, students were allotted time in class to work on their respective events; however, the majority of project work was outside of class. Most groups had weekly meetings with their agency supervisors. Although each event was unique, all students had assignments that included; planning, implementation, and evaluation of a special event. In the process of completing this assignment students were involved in tasks such as seeking donations and sponsorships, marketing for volunteers and participants, developing risk management plans and documenting the event by creating a written program plan.

Agency supervisors provided group and individual ratings on professionalism (preparedness for meetings, meeting deadlines) and quality of work (following through on tasks, asking appropriate questions, communication, working independently, and response to constructive feedback) after completion of the project. Students were aware in advance that this evaluation would contribute to the grade which they would earn for their service-learning project.

Data Collection

Data were collected during the 2011-12 academic year. The student reflection process included three written reflections based on guiding questions. Questions were developed in accord with professional literature about established competencies within the recreation industry (Hurd et al., 2008) and the indices considered in Social-Cognitive Theory (SCT) to be influential on student learning (Schunk, 2004).

The first reflection paper, submitted a week after their initial meeting with the agency, focused on personal factors that could impact the learning process such as student apprehensions and expectations for the project, predictions about where they thought their group would excel, and feelings about the environment to which they were assigned. The second reflection paper, submitted one week prior to their event, asked each student to reflect on their personal role in the project (behaviors); areas they need to improve upon (personal factor and behavioral capacity) as well as asking if they felt prepared for the event (personal factor – self efficacy). The third reflection paper, submitted one week after the event, asked them to compare original expectations to what actually happened (behaviors), as well as things they learned through the project which they perceived they could not have learned in a classroom (environment linked to behaviors).

Students were asked to write openly and honestly on the reflection papers. To encourage this, students were informed prior to assignments that papers would be graded based on quality and thoroughness of the responses, not on the actual perception of the event. For instance, grading was not affected by whether the grader liked or agreed with the response; but rather how thoroughly the student responded.

Data Analysis

All reflection papers submitted by students were included in analysis. A total of 186 reflection papers were analyzed, including 63 First, 63 Second, and 60 Third papers. Content analysis was conducted on answers to eight questions from the reflection papers which related specifically to Social-Cognitive Theory (SCT). Due to the volume of data, the researchers decided to conduct a conceptual analysis which required that they identify how many times specific words or phrases were used in the text being evaluated. This is the most traditional form of content analysis when researchers choose a concept and then seek to quantify and tally its presence in the documents under review (Busch et al., 2014). The reflection papers covered a number of topics not considered in this paper therefore focusing on just those concepts which were of interest to the researchers was the most appropriate method of analysis. Two researchers independently reviewed all the reflection papers seeking to identify content specific to the entry-level competencies as defined by Hurd et al. (2008). See Appendix #1 for the complete list of competencies.

Following the procedures identified in the literature for content analysis (Crewswell, 2009; Busch et al., 2013), researchers created a qualitative codebook consisting of the 40 competencies needed by entry-level recreation professionals. To increase reliability and minimize coding errors, the researchers initially agreed to look for specific words or groups of words that contained the explicit terms for which they were looking. For example, 'learning to manage time' was to be counted as 'time management'. In addition, they were to highlight implicit terms or phrases that seemed to be about competencies but did not actually include the explicit terms. Each of the researchers then conducted a manual frequency count of the explicit terms under investigation. Following the individual coding, comparison revealed 100% agreement on the explicit terms. After some discussion regarding implicit terms or phrases it was decided that while the researchers preferred to stay with explicit terms the majority of the time, there were a few cases where including implicit terms was appropriate. Two examples of implicit terms included in the final count were the words 'sponsorship' and 'donations'. Those words are not in the table of competencies; however, practice and literature (Allen, O'Toole, McDonnell, Harris, & Stokes, 2005; Cornwell, 2010; Janes, 2009) in the discipline list both as marketing functions. Therefore, anytime the students mentioned 'sponsorship' or 'seeking donations' it was coded as marketing. Additional implicit terms examined were 'risk management' which was included under 'laws and legal matters', 'being adaptable' which was coded under 'be flexible', and 'taking charge' which was coded as 'leadership skills and abilities'. Other terms did not really fit under a competency or relate to SCT factors and were therefore ignored in the coding process.

Findings

The three reflection papers were graded assignments. However, three of 63 students did not complete the third reflection paper, resulting in a 95.2% return rate. In total there were eight questions across the three reflection papers that directly related to personal factors, environment, and behavior as suggested by the triadic reciprocal determinism of Social-Cognitive Theory (SCT). Consolidating the data from both semesters, students reported learning/having to use 32 different competencies in the areas of business acumen, communications, community relations,

interpersonal skills and management techniques. None of the students mentioned any of the competencies in planning and evaluation. Table 1 shows how many times the competencies were mentioned in reflection papers by semester and for the year.

Table 1

Competencies reported in reflection papers

Entry Level Professional Competencies mentioned by students in reflection papers		Fall 2011	Spring 2012	Total across the academic year
Business Acumen				
1	Understand financial processes (i.e., purchasing, budget)	0	1	1
2	Develop, monitor, and stay within a budget	24	8	32
3	Possess knowledge of management principles	0	1	1
4	Demonstrate basic knowledge of laws and legal matters affecting the field	1	8	9
Communications				
6	Clearly communicate with staff, customers, and the public	28	27	55
7	Possess effective written and oral communication skills	2	0	2
8	Listen to staff and customers	1	2	3
9	Implement marketing techniques	38	50	88
10	Communicate the organization's values, vision, and mission	1	0	1
Community Relations				
11	Know the community and its needs	10	5	15
12	Understand customer service practices	1	0	1
13	Have the ability to deal with the public	2	4	6
14	Develop partnerships with other organizations	1	0	1
Interpersonal Skills				
16	Be creative and innovative	24	29	53
17	Be flexible	2	10	12
18	Have patience	1	3	4
19	Be enthusiastic and have a positive attitude	9	7	16
20	Be open-minded	2	2	4
21	Deal with personality conflicts	0	2	2
22	Understand the concept of criticism and accept constructive criticism	1	0	1
23	Take initiative	1	2	3
Management Techniques				
24	Use effective problem-solving and conflict-resolution skills	7	13	20
27	Supervise, discipline, and evaluate a diverse staff	0	1	1
28	Motivate employees	2	0	2

29	Have leadership skills and abilities	9	18	27
30	Be able to work in a team	14	42	56
31	Use effective organizational skills	8	19	27
32	Prioritize and manage multiple tasks	4	1	5
33	Demonstrate effective time-management skills	37	35	72
34	Conduct program evaluations	2	0	2
35	Schedule programs, leagues, and staff	0	1	1
36	Network within and outside the profession	3	2	5
Totals		235	293	528
		27 competencies mentioned at least 1 time	**25 competencies mentioned at least 1 time**	**32 Different competencies mentioned at least 1 time across the academic year**

Discussion

Social-Cognitive Theory (SCT) provides a theoretical framework to understand how students learn the competencies needed for a successful career in recreation. The discussion will therefore center on the three categories of influences identified within SCT as impacting learning outcomes. Figure 2 is a visual representation of the major findings. The section will conclude with a discussion of the limitations of the study.
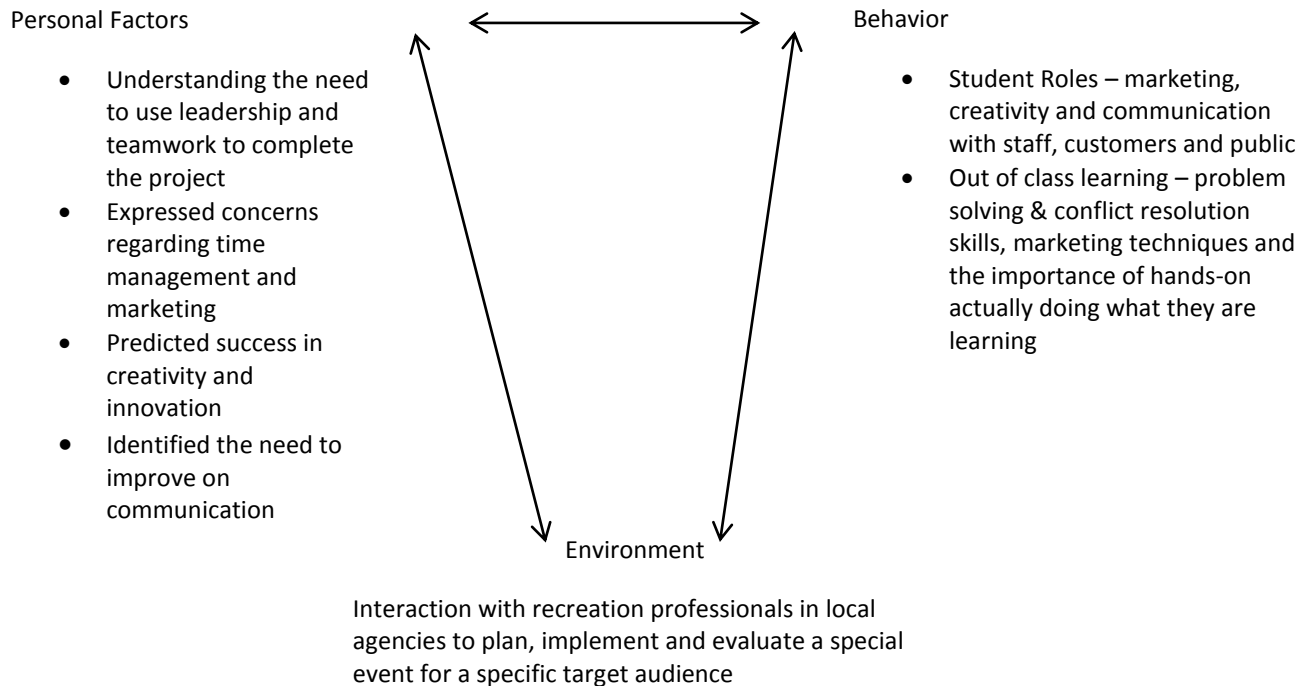
Personal Factors

- Understanding the need to use leadership and teamwork to complete the project
- Expressed concerns regarding time management and marketing
- Predicted success in creativity and innovation
- Identified the need to improve on communication

Behavior

- Student Roles – marketing, creativity and communication with staff, customers and public
- Out of class learning – problem solving & conflict resolution skills, marketing techniques and the importance of hands-on actually doing what they are learning

Environment

Interaction with recreation professionals in local agencies to plan, implement and evaluate a special event for a specific target audience

Figure 2. Major Findings

Personal factors

As discussed previously, personal factors may include a learner's knowledge, perceived self-efficacy, behavioral capacity, outcome expectations, fears, and goals related to a given social situation (Housman et al., 2012). The first and second reflection papers both included questions about personal factors.

The first reflection paper focused on the personal factors of expectations regarding the project, anything they might be concerned or worried about, and predictions as to areas in which their group would excel. Selected student quotes follow the findings for each question:

Personal Factor: Expectations. Regarding expectations, of the 63 students who submitted Reflection Paper 1, 18% (n=11) thought that implementing marketing techniques would be a difficult task, and 16% (n=10) mentioned they would excel at having leadership skills or being able to work in a team.

> I expect to learn a lot from this project. I expect to learn how to compose a sponsorship plan and spread the word about an event . . . I feel that this project will give me first-hand experience to feel confident when doing this in my future career.

Personal Factor: Fears/Concerns. When asked what fears/concerns they had, 28 (45%) students responded with "demonstrate effective time management skills". The second most frequent response was "implement marketing techniques," which 34% of the students (n=21) wrote about.

> The most difficult aspect of our project, in my opinion, will probably be time management and getting everything done in the small window that we have to do it. I also think that getting donations for different prizes we would like to have will be tough but not impossible.

> I am nervous about going to potential sponsors to ask for support.

Personal Factor: Predictions of Areas of Group Success. Students mentioned 11 competencies in which they felt their project group would excel. The two competencies mentioned most frequently were "be creative and innovative" (17 or 27%) and "be able to work in a team" (13 or 21%). Comments related to these expectations included: "Once we all get together, we are extremely creative. Coming up with fun games for the kids and making the event an overall success will be very easy," and "I think my group will work together with a great sense of cohesion. We all want to put on a great event, and have some creative ideas to get it going."

The second reflection paper focused on the personal factors of self-efficacy (readiness for the event) and behavioral capacity (areas where they needed to improve upon). Student responses are below:

Personal Factor: Self-efficacy - Readiness for the event. The results from this reflection showed that 40 of the 63 students (63.5%) stated that they felt completely prepared for the event. Two (3%) responded 'somewhat', 7 (11%) did not provide a definitive answer, and the remaining 14 (22%) had versions of 'no'. Of the students responding 'no' that did not feel ready three (4%) indicated that although feeling not fully prepared at that time, they expected tasks were doable and were confident they would be ready by event time. Five (8%) responded that although they had to say 'no' at this time, they thought they were as prepared as possible. "Yes, I feel like the group and I are very prepared for the event. Our group has put in a lot of time and

effort into this event and I believe all of that will pay off for us when our event takes place." Another student wrote,

> I feel like my group and I are prepared for the event to an extent. The event's date was changed to three weeks earlier than planned and it has been chaotic trying to get everything to come together and find teams that want to participate during Spring Break…As far as the day of the event goes, I think we are prepared and know what to expect and what our roles are for that day.

Personal Factor: Behavioral capacity. Students were asked to reflect upon what area(s) they felt they needed to improve on most. Answers ranged from the very specific (such as need to improve on technical computer skills) to more broad answers like, "The thing I or our group need to improve on is communication." Communication was a very common answer amongst respondents, being the most frequently cited area to improve on (14 students, 22%, answered in this area). Other popular responses included "time management" with 10 students (16%) and "improved leadership" with 6 students (10%).

In summary, when asked about personal factors students commented on the need to use leadership skills and teamwork if the project was going to be completed to a high standard. They expressed concerns regarding the amount of time they needed to commit to the project and whether or not they could manage their time effectively. They were also concerned about one marketing aspect – securing sponsorships and donations. They predicted success in the areas of creativity and innovation, feeling that each member of their team had something to contribute to the overall effort. At the end of the project they acknowledged the continuing need to improve upon communication as they work on similar projects in the future. These findings are consistent with what one might expect from early career recreation professionals. It is normal for students to be nervous about a large project which will require them to complete tasks which they may not have done previously. According to research conducted by Hurd, Elkins and Beggs (2014) prior to their final internship students indicated that they were more confident with interpersonal skills such as leadership and teamwork, and "less certain about competencies discussed in class but not yet experienced in the field" (p. 51) such as seeking sponsorships and donations.

Behavior

According SCT, behavior may include such things as learning new skills, autonomy and persistence (Schunk, 2004). Learning new skills is one of the primary benefits of service learning and it gives students the opportunity to gain practical experience. Students were asked one question each in reflection papers two and three which related to behavior.

Behavior: Personal Role in Project (reflection paper two). A total of 16 different competencies were mentioned in response to the prompt, "discuss your role in this project and what do you feel have been your most significant contributions." The most frequent response was "implement marketing techniques" (24 or 38%), followed by 16 responses (25%) for "be creative and innovative", and 14 (22%) for both "clearly communicate with staff, customers and the public" and "demonstrate effective time management skills."

> "I feel that my role in the project was a creative one. I worked hard on brainstorming new ways to do things, looking (for) non-traditional vendors, and designing flyers."

> "One of the most important roles that I and others have had is that of communicator."

"We all went out and spoke to potential sponsors individually and as a group. We, however, were all assigned a specific assignment that we were in charge of. My specific assignment was to gather volunteers. I have to make sure that we have the amount of volunteers needed to run the event smoothly."

Behavior: Expectations and Outcomes. After completing their event students were asked to compare original expectations to the actual outcome. Responses were grouped according to meeting expectations, exceeding expectations or not meeting expectations. Thirty eight students (63%) reported that the experience matched their expectations. Four students reported that their expectations were higher than experienced in the actual event, and seven reported that the event exceeded their expectations. Two students were unable to answer the question because they changed groups after the first reflection paper, and nine students failed to answer thoroughly enough to use for data. Examples of responses include:

The expectations I had leading up to this event were very similar to what I experienced the day of the event. One of the expectations that I had was that all the kids would have fun doing the activities without harming themselves. My group members and I planned out each activity so they were all safe for all the participants…This event turned out to be a great experience that I can look back on in a positive light for the rest of my life.

My expectations for this event possibly were set too high. I was originally expecting there to be around 650 participants since …we were told to expect around 500. After the event Erin told me that we actually had somewhere between 200 and 250. I was really let down by that number…

When I first started working on the fest (actual event name removed by researchers) I was excited to be working on such a large event for the first time. After a couple of meetings we weren't getting the desired response from the art and food vendors. I was beginning to expect that the event would not be as large and we had hoped…The results of the festival far exceeded my expectations prior to the event.

In summary, the students were able to clearly state their roles in completing the assigned project. It is interesting to note that two of the top five responses regarding role of the student matched those about which students indicated concern in the first reflection paper (time management and marketing). Additionally, the issues the students reported in regards to expectation vs. outcomes upon completion of the project were closely related to the ones they had brought up under behavioral capacity as things they still needed to improve (communication skills, time management and leadership). Housman et al. (2011) stated "providing students with service-learning opportunities creates a sense of urgency on the student's behalf to effectively convert principles discussed in class to meet the needs of the community" (p.274). Having to design and implement an event for a local recreation agency (rather than just creating one on paper) not only created a sense of urgency it also provided a huge sense of accomplishment. As will be shown in the next section, the students learned many things which they would not necessarily have gained by staying in the classroom.

Environment

Environmental influences that resulted in behavioral changes (Bandura, 1986), occurred both within the context of the classroom and at the agency location. Students were asked about environment in reflection papers one and three.

Environment (reflection paper one). Students were asked if they felt they had been provided with adequate information during the first meeting with the agency supervisor in regards to the agency as well as the event. Students responded that they had been provided with the following types of information: dates/deadlines, budget, tasks that required creativity, general layout of event, goals to achieve, list of available resources, information about the target audience and sponsors. No students mentioned not receiving needed information.

Environment Linked to Behavior: Out of Class Learning (reflection paper three). In response to what students perceived they learned that they would not have learned in a traditional classroom setting, students mentioned a total of 20 competencies. The most frequently mentioned competency was 'use of effective problem-solving and conflict resolution skills'. Twelve (20%) reported experiencing that things did not go according to plan and having to problem solve in order to make things work was a great learning experience. For example:

> What I learned from this project is that things cannot always go according to plan. Improvising is a major part of events and that is something that everyone must find out from experience. A classroom cannot teach me how to deal with a situation that pops up right in front of my face. Through creativity and effectiveness, we accomplished more than we imagined possible at the beginning of the semester.

> Learning how to improvise and change things to better the program I don't think I could have learned in the classroom. You do not figure out how to improvise or be creative and use your head until you are at the event facing different obstacles. Learning to fix things and be creative and open minded can only be learned during program planning because it is more surreal and encourages you to make the program successful.

> At our event while they were setting up the screen for the movie there was a malfunction that happened and we could not use that screen. It was good experience to see how our supervisor handled the situation and figured out what she wanted to do. We hear about those things in the classroom but don't get to see how they really play out.

The second most mentioned competency was "demonstrate effective time management skills". Twelve (20%) students mentioned time management in their reflection papers. The third competency was "implement marketing techniques" which was mentioned by 11 students (18%).

In addition to competencies, 18 students also commented about the hands-on experience (using the words "hands-on" or "firsthand") and how it changed their understanding of the techniques needed to successfully manage recreation programs.

> A student can easily study how to camp, read how to put up a tent and hear how you can roast a perfect marshmallow. But it's not until you experience it on your own that you can honestly say you're able to put yourself in that position and relate to your participants. If I hadn't personally gone through the camping experience, then it would have been even more difficult for me to relate to my participants and group members.

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From completing this project I learned how time consuming even the smallest of projects can be. I also learned a lot about budgeting, legal issues, and the importance of networking. All of these things can be taught in the classroom, but to actually get hands on experience makes learning these concepts life lasting. If I had sat in the classroom and just taken a test over these concepts I would not have learned nearly as much.

If I had not gotten to have hands on experience working with this festival I do not believe I would have learned much at all. Reading about the preparation for a large event and then actually being the one moving barricades and posting signs around town at six in the morning are two much different ways of grasping the base concepts.

In the classroom, curriculum reflected the program planning process that students were actively engaged in at their agency site. It provided an opportunity to ask questions about what they were learning and receive information and feedback from the professor. The classroom complimented the service learning by providing an environment in which the students could reflect on experiences and seek guidance on how to proceed in an effective manner. It also provided a workspace for students to meet with their teams as there were multiple opportunities during the semester for students to work on group assignments. Group assignments were made based on student preferences and only rarely were students not placed in one of their top three choices. Once placed at the agency, students met with their supervisor and student group between 3-8 times prior to their event. The agency supervisor provided an environment of support where students were able to interact and receive guidance.

A variety of projects can sometimes lead to confusion for students (Keshock et al., 2012) especially when it comes to what students believe they will get out of the experience. At the beginning of the semester students frequently compare their project to others based on a number of factors: group size, size of the event, whether it is a new or repeat event and how much money the partner agency has allocated for the event. In spite of the wide variety of projects a consistent theme in the papers was that of being able to learn "hands-on" what students would not be able to learn in the classroom namely, problem-solving and conflict management, time management and marketing techniques. This experiential learning played a key role in the development and learning of the students.

Study Limitations

There are several aspects of this study which may limit the findings. First, the fact that reflection papers were graded may have influenced student responses. The researchers attempted to minimize this by emphasizing numerous times that the content itself was not being graded, just how well they did or did not attempt to answer the questions. In addition, the primary instructor did not see any of the reflection papers until after the semester ended so as to not be influenced by specific comments any students were making in their reflection papers. Second, in each of the semesters there were many different opportunities to which the students could have been assigned. Different agency types, different agency supervisors and different types and scale of events most assuredly led to different experiences for students. While this is not an unusual occurrence (see Keshock et al., 2012; Ruan et al., 2011), it does create a limitation in that no two projects were exactly the same which limits the generalizability of the data. The next potential limitation is related to data coding. The content analysis conducted was conceptual rather than relational. With few exceptions, noted earlier in the methods section, the researchers relied on

the specific words used by the students. They did not delve any deeper into what a student may or may not have meant by using certain terms. Additionally, because it was a content analysis only the researchers were unable to identify if there were different levels of competency being identified. This leads to the next limitation. There was no member checking to see if the researchers were interpreting the data the way in which the students meant it to be understood. The researchers worked to minimize this problem by double coding and verifying how the various terms were coded. The final limitation relates to demographics of the participants. The only data collected was gender and age which makes it impossible to know if other demographic factors may have influenced the outcomes.

Implications

Service learning benefits students (i.e., Keshock et al., 2012; Ruan et al., 2011). Students report being more prepared for working upon graduation and agencies report that our students enter the workplace more qualified because of their experience. As educators, we can attest to the higher test grades, improved class discussions and feedback from students and community partners through service learning projects. However, as recreation programs and classroom numbers grow across the nation and instructors are asked to stretch resources more thinly, the idea of inherent and implied learning may be insufficient to substantiate students and teachers spending the time necessary to coordinate and complete these learning opportunities.

How do we as researchers translate "prepared students" into statistics that clearly detail exactly what our students learn through out of class experiences and how those relate to the competencies required to be a successful recreation professional? Although this study only offers conceptual analysis of data and is therefore somewhat limited, it does illustrate what is found in the literature and provides support for the anecdotal information that we have. This study also provides evidence of the merits of service learning for increasing entry-level competencies in the recreation field. For example, students continually reported that effective problem solving and conflict management skills, marketing techniques, and time-management skills were not only competencies acquired through this project but also concepts that they felt they could not have learned in the classroom.

Research in the field of service learning has continued to increase over the last 20 years as has research related to entry-level competencies for graduates of recreation programs. While these two areas of research grow, there has been little done to link the two subjects together. If it is true that students are more confident once they've experienced competencies, as educators, we have a responsibility to connect classroom work to real-world experience (Hurd et al., 2014). Research of this nature is necessary to justify the continuation of service learning and application in recreation programs.

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Appendix

Appendix 1. Entry-level Competencies identified by Hurd et al. (2008).

Business Acumen
1   Understand financial processes (i.e., purchasing, budget).
2   Develop, monitor, and stay within a budget.
3   Possess knowledge of management principles.
4   Demonstrate basic knowledge of laws and legal matters affecting the field.
5   Understand technology and how to use it.
Communications
6   Clearly communicate with staff, customers, and the public.
7   Possess effective written and oral communication skills.
8   Listen to staff and customers.
9   Implement marketing techniques.
10   Communicate the organization's values, vision, and mission.
Community Relations
11   Know the community and its needs.
12   Understand customer service practices.
13   Have the ability to deal with the public.
14   Develop partnerships with other organizations.
15   Work with boards and elected officials.
Interpersonal Skills
16   Be creative and innovative.
17   Be flexible.
18   Have patience.
19   Be enthusiastic and have a positive attitude.
20   Be open-minded.
21   Deal with personality conflicts.
22   Understand the concept of criticism and accept constructive criticism.
23   Take initiative.
Management Techniques
24   Use effective problem-solving and conflict-resolution skills.
25   Make ethical decisions.
26   Understand the hiring process.
27   Supervise, discipline, and evaluate a diverse staff.
28   Motivate employees.
29   Have leadership skills and abilities.
30   Be able to work in a team.
31   Use effective organizational skills.
32   Prioritize and manage multiple tasks.
33   Demonstrate effective time-management skills.
34   Conduct program evaluations.
35   Schedule programs, leagues, and staff.
36   Network within and outside the profession.
37   Participate in policy formation, evaluation, and revision.
Planning and Evaluation
38   Provide input on strategic, master, recreation, marketing, and technology plans.
39   Conduct research and evaluation.
40   Conduct needs assessments.

Zimmerman, J.M., Dupree, J., & Hodges, J.S.

References

Allen, J., O'Toole, W., McDonnell, I., Harris, R., & Stokes, R. (2005). *Festival and special event management (3rd ed)*. Milton, Qld.: Wiley.

Astin, A.W., & Sax, J. L. (1998). How undergraduates are affected by service participation. *Journal of College Development*, *39*(3), 251-263.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Barcelona, B, Hurd, A. R., & Bruggeman, J. A. (2011). A competency-based approach to preparing staff as recreation and youth development leaders. *New Directions for Youth Development, 130*(Summer 2011), 121-139. doi: 10.1002/yd.401

Barcelona, B., & Ross, C. M. (2004). An analysis of the perceived competencies of recreational sport administrators. *Journal of Park and Recreation Administration, 22*(4), 28-46.

Batchhelder, T. H., & Root, S. (1994). Effects of an undergraduate program to integrate academic learning and service: Cognitive, prosocial cognitive and identity outcomes. *Journal of Adolescence*, *17*(4), 341-355. doi: 10.1006/jado.1994.1031

Bernacki, M. L., & Jaeger, E. (2008). Exploring the impact of service-learning on moral development and moral orientation. *Michigan Journal of Community Service Learning*, *14*(2), 5-15.

Bocarro, J. (2003). Maintaining the balance between service and learning: The use of journals in promoting critical thinking. *SCHOLE: A Journal of Leisure Studies and Recreation Education,18,* 7-21.

Bringle, R., & Hatcher, J. (1997). Reflection. *College Teaching, 45,* 153-158. doi: 10.1080/87567559709596221

Busch, C., De Maret, P., Flynn, T., Kellum, R., Le, S., Meyers, B., & Palmquist, M. (2014). *Writing@CSU Writing Guide: Content Analysis.* Retrieved May 23, 2014, from http://writing.colostate.edu/guides/guide.cfm

Busser, J. A., & Bannon, J. J. (1987). Work activities performed by management personnel in public leisure service organizations. *Journal of Park and Recreation Administration, 5*(1), 1-16.

Coetzee, B. A., & Bloemhoff, H. J., & Naude, L. (2011). Students' relections on attainment of competencies in a community service-learning module in human movement science. *African Journal for Physical, Health Education, Recreation and Dance, 17*(3), 547-563. doi: 10.4314/ajpherd.v17i3.71107

Cohen, J., & Kinsey, D.F. (1994). Doing good and scholarship: A service learning study, *Journalism Educator*, *48*(4), 4-14. doi: 10.1177/107769589304800402

Cooke, C. A., & Kemeny, M. E. (2014). Student perspectives on the impact of service learning on the educational experience. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 29*(1)*,* 102-111.

Cornwell, T. (2010). Sponsorship-linked marketing development. *Sport Marketing Quarterly*, *4*(4), 13-24.

Council on Accreditation of Parks, Recreation, Tourism and Related Professions (2014). *Learning Outcomes Standards and Assessments*, Adopted Oct 2008, revised April 2014, accessed on May 16, 2014 retrieved from: http://www.nrpa.org/uploadedFiles/nrpa.org/Professional_Development/Accreditation/COAPRT/2013%20COAPRT%20Standards_04-24-14.pdf.

Crossley, J. C., Jamieson, L. M. & Brayley, R. E. (2007). *Introduction to commercial recreation and tourism: An entrepreneurial approach* (5th ed.). Champaign, IL: Sagamore.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approach* (3rd ed.). Thousand Oaks, CA; SAGE Publications.

Cucina, I., & McCormack, L. (2001). A student-centered community-service project for higher education. *Journal of Physical Education, Recreation & Dance*, *72*(9), 47-50. doi: 10.1080/07303084.2001.10605867

Engberg, M. E., & Fox, K. (2011). Exploring the relationship between undergraduate service-learning experiences and global perspective-taking. *Journal of Student Affairs Research and Practice*, *48*(1), 85-105. doi: 10.2202/1949-6605.6192

Flores, D. (2011). *Email communication received April 5, 2011.*

Giles, D. E., & Eyler, J. (1994). The impact of a college community service laboratroy on students' personal, social, and cognitive outcomes. *Journal of Adolescence*, *17*, 327-339. doi: 10.1006/jado.1994.1030

Hammersley, C. H., & Tynon, J. F. (1998). Job competencies of entry level resort and commercial recreation professionals. *Journal of Applied Recreation Research, 23*(3), 225-17.

Hendricks, W.W., & Miranda, B. (2003). A service-learning approach in wilderness education. *Journal of Physical Education, Recreation & Dance*, *74*(7), 1-4. doi: 10.1080/07303084.2003.10609232

Housman, J., Meaney, K. S., Wilcox, M., & Carazos, A. (2012). The impact of service-learning on health educations students' cultural competence. *American Journal of Health Education, 42*(5), 269-278. doi: 10.1080/19325037.2012.10599245

Hurd, A. R. (2004a). Competency development for board members in public park and recreation agencies. *Journal of Park and Recreation Administration, 22*(4), 43-62.

161
Journal of the Scholarship of Teaching and Learning, Vol. 14, No. 4, October 2014.
josotl.indiana.edu

Hurd, A. R. (2004b). Keys to individual and agency success. *Parks & Recreation, 39*(11), 44-50.

Hurd, A. R. (2005). Competency development for entry level public parks and recreation professionals. *Journal of Park and Recreation Administration, 23*(3), 45-68.

Hurd, A. R., Barcelona, R. J., & Meldrum, J. T. (2008). *Leisure services management.* Champaign, IL: Human Kinetics.

Hurd, A. R., & Buschbom, T. (2010). Competency development for chief executive officers in YMCAs. *Managing Leisure, 15*(1), 96-111. Doi: 10.1080/13606710903448186

Hurd, A. R., Elkins, D. J., & Beggs, B. A. (2014). Using competencies to assess entry-level knowledge of students graduating from parks and recreation academic programs. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 29*(1), 51-59.

Hurd, A. R., & McLean, D. D. (2004). An analysis of perceived competencies of CEOs in public park and recreation agencies. *Managing Leisure, 9,* 96-111. doi: 10.1080/13606710410001709626

Jamieson, L. M. (1987). Competency-based approaches to sport management. *Journal of Sport Management, 1*(1), 48-57.

Janes, P. C. (2006). *Marketing in leisure and tourism: Reaching new heights.* State College, Pa.: Venture Pub., Inc.

McCarthy, A. M., & Tucker, M. L. (2002). Encouraging community service through service learning. *Journal of management education*, *26,* 629-647. doi: 10.1177/1052562902238322

Meaney, K., Griffin, K., & Bohler, H. (2009). Service-learning: A venue for enhancing pre-service educators' knowledge base for teaching. *International Journal for the Scholarship of Teaching and Learning*, *3*(2), 1-17.

Meaney, K. S., Housman, J., Cavazos, A., & Wilcox, M. L. (2012). Examining service-learning in a graduate physical education teacher education course. *Journal of the Scholarship of Teaching and Learning*, *12*(3), 108-124.

Moorman, M. K., & Arellano-Unruh, N. (2002). Community service-learning projects for undergraduate recreation majors. *Journal of Physical Education, Recreation & Dance*, *73*(2), 42-52. doi: 10.1080/07303084.2002.10607753

Morgan, W., & Streb, M. (March 2001). Building citizenship: How student voice in service-learning develops civic values. *Social Science Quarterly*, *82*(1), 155-169. doi: 10.1111/0038-4941.00014

Mumford, V., & Kane, J. (2006). Service-learning in sports. *Journal of Physical Education, Recreation & Dance*, *77*(3), 38-43, 47. doi: 10.1080/07303084.2006.10597843

Olsen, H. M., & Burk, B. (2014). Using reflection to assess students' ability to learn and develop leadership skills. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 29*(1), 75-90.

Ostiguy, L., & Hopp, R. (1995). Partners in inner-city youth programming. *Journal of Physical Education, Recreation & Dance*, *66*(4), 32-33. doi: 10.1080/07303084.1995.10608132

Petersen, J. C., Judge, L., & Pierce, D. A. (2012). Conducting a community-based experiential-learning project to address youth fitness. *Journal of Physical Education, Recreation & Dance*, *83*(9), 30-36. doi: 10.1080/07303084.2012.10598793

Reed, V., Jernstedt, G. C., Hawley, J. K., Reber, E. S., & DuBois, C. A. (2005). Effects of a small-scale, very short-term service-learning experience on college students. *Journal of Adolescence*, *28*(3), 359-368. doi: 10.1016/j.adolescence.2004.08.003

Riley, K. (2006). Service-learning evaluation projects: A step-by-step guide. *Journal of Physical Education, Recreation & Dance*, *77*(6), 39-43, 54. doi: 10.1080/07303084.2006.10597893

Ruan, B., Edginton, C. R., Chin, M. K., & Ching Mok, M. M. (2011). A pathway to an integrative/holistic education: Camp Adventure Child and Youth Services (CACYS) – a model service learning programme. *World Leisure Journal*, *53*(3), 186-205. doi: 10.1080/04419057.2011.606827

Sax, L., & Astin, A.W. (1997). The benefits of service: Evidence from undergraduates. *The Educational Record*, *78*(3-4), 25-32.

Schunk, D. H. (2004). Social cognitive theory. *Learning theories: An educational perspective* (4th ed., pp. 83-135). Upper Saddle River, NJ: Pearson Education.

Smith, D. (2003). Preparing Students to Make a Difference: Community Asset Mapping as a Vehicle for Involving Students in Community Action. *SCHOLE: A Journal Of Leisure Studies And Recreation Education, 18*(1). Retrieved from http://js.sagamorepub.com/schole/article/view/207. Date accessed August 14, 2012.

Stevens, C. A. (2008). *Service learning for health, physical education and recreation*. Champaign, IL: Human Kinetics.

Stringer, L. A., & Kowalski, C. L.(2003). "Peer" into success: Students as peer advisors in leisure and recreation departments. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 18*, 81-94.

Werner, J. (2011). *Email communication received March 30, 2011*.

Williams, A., & Lankford, S. (1999). Service learning: You can get there from here. *SCHOLE: A Journal of Leisure Studies and Recreation Education, 14*(1). Retrieved from http://js.sagamorepub.com/schole/article/view/277, Date accessed August 14, 2012.

Mission

Founded in 2001, the Journal of the Scholarship of Teaching and Learning (JoSoTL) is a forum for the dissemination of the Scholarship of Teaching and Learning in higher education for the community of teacher-scholars. Our peer reviewed Journal promotes SoTL investigations that are theory-based and supported by evidence. JoSoTL's objective is to publish articles that promote effective practices in teaching and learning and add to the knowledge base.

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John Dewey[1] **and Marie Curie**[2]

Abstract: This paper provides the style sheet for the Journal of the Scholarship of Teaching and Learning. Manuscripts submitted for publication should adhere to these guidelines.

Keywords: radiation, metacognition, identity theory, constructivism, educational philosophy.

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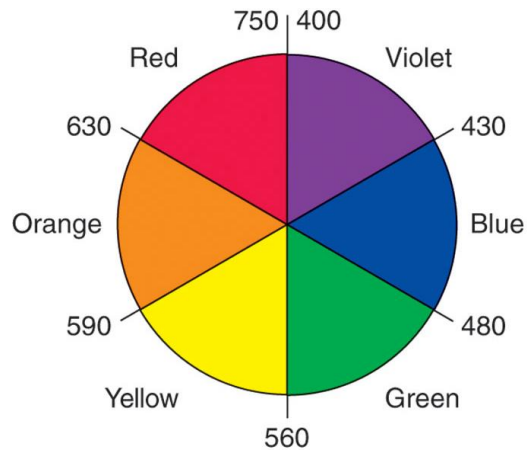
Figure 1. Color wheel with wavelengths indicated in millimicrons. Opposite colors are complementary.

Acknowledgements

Acknowledgements should identify grants or other financial support for this research by agency (source) and number (if appropriate). You may also acknowledge colleagues that have played a significant role in this research.

Appendix

Please insert any appendices after the acknowledgments. If your submission has only one appendix, this section should be labeled '*Appendix.*' More than one appendix will change the section label to '*Appendices.*' Each appendix should have a title; if you are including items from your class or research, please alter them to include a title. Appendices should be alpha-order (Appendix A, Appendix B, etc.) These labels and titles should be at the top of the page, left justified, italicized.

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References

Coffin, D. A. (1993). Using the competitive edge. *Journal of Economic Education*, *24*(1), 62-69.

Garcia, J., & Rodriguez, P. (2002). The determinants of football match attendance revisited: Empirical evidence from the Spanish football league. *Journal of Sports Economics*, *3*(1), 18-38. doi: 10.1177/152700250200300103

Hamilton, S. J. (1995). *My name's not Susie: A life transformed by literacy*. Portsmouth, NH: Boynton/Cook Publishers.

Pappas, D. (2004). Fixing the fan cost index: A more realistic view. Retrieved April 21, 2004, from http://www.baseballprospectus.com/article.php?articleid=2790.

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