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Research in Progress

FIRST, DO NO HARM: EFFECTIVE, INEFFECTIVE, AND COUNTERPRODUCTIVE TEACHING METHODS

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In response to public criticism of the quality of college education (e.g. Arum & Roksa, 2011), the Association to Advance Collegiate Schools of Business (AACSB) International and other accreditors have increased their emphasis on assessing student outcomes (Johnson, 2012; Koppel & Hollister, 2009; Maki, 2012). Universities are expected to define what we are trying to teach, measure how well our students are learning these things, and "close the loop" by going back and adjusting curriculum to address any weaknesses. Presumably, measurable improvements in learning and student success will follow, completing a cycle in the continuous improvement model.

However, intuitively appealing educational interventions can be ineffective (Pashler, McDaniel, Rohrer, & Bjork, 2008) or even counterproductive (Forsyth, Lawrence, Burnette, & Baumeister, 2007), and if we are to make strides toward continuous improvement, we must first take care to consider the evidence in order to decide which measures are likely to bring about positive change.

Purpose—"Do No Harm"

In this paper, we present the current evidence on various teaching methods. Our contribution to the current literature (e.g. Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013; Pashler et al., 2007; Rohrer & Pashler, 2010; Weinstein, McDermott, & Roediger, 2010) is to update the research and tailor it to tertiary education. In addition we distinguish actions that can be taken by individual students or instructors (e.g. using flashcards) from those that require institutional action (e.g. reducing class size), and we include both learning and completion outcomes.

Before committing resources to an intervention, it seems appropriate to examine the evidence in favor of that intervention. "It seems reasonable to expect that those preparing students for society and the world of work would themselves take an evidence-based approach to their teaching" (Klimoski & Amos, 2012, p. 686). We find that the possibility of doing harm is real, either by wasting resources on an unproven and ineffective method, or worse, by reducing student learning or likelihood of completion. We borrow our working definition of evidence-based education from the literature on evidence-based management: "The systematic use of the best available evidence to improve practice" (Reay, Berta, & Kohn, 2009, p. 5).

Finding evidence upon which to base recommendations can be less than straightforward. As in any field, one study's findings might conflict with another, or the generalizability of a set of findings might be in doubt (Kvernbekk, 2011). In addition, the field of education has not been uniformly welcoming of an evidence-based approach, with the result that many important questions may have gone untested (Cook, 2002; Cooper, Levin, & Campbell, 2009). The framework that follows will allow us to allow for the quality of evidence in evaluating the effect of various interventions on student learning.

Procedure

The Institute of Education Sciences *What Works Clearinghouse* provides a summary that was last updated in 2007 (Pashler et al., 2007). We have used this review as a model, adding recent studies and considering institutional policies as well as individual learning strategies. We focus on two sets of outcomes: student learning and completion rates.

Performance based funding has focused some universities' efforts on maximizing enrollment and graduation rates (Friedel, Thornton, D'Amico, & Katsinas, 2013). Sufficient headcount is necessary for a school's financial health, and examining completion rates can highlight programmatic bottlenecks. A single-minded focus on retention and completion, however, can lead to a "student as customer" mindset (Laing & Laing, 2011), where challenging coursework is watered down, cheating goes unpunished, and student learning suffers. Student learning, therefore, is a separate category.

To denote the quality of evidence, we used Reay and associates' six-level framework:

Level 1: Large scale randomized, controlled trials (RCTs) or meta-analyses
Level 2: Evidence from small sample RCTs, systematic literature reviews
Level 3: Retrospective case control studies, prospective cohort studies, multisite observational studies
Level 4: Small sample, single site observational studies
Level 5: Descriptive studies, case studies
Level 6: Expert opinion, anecdotal evidence (2009, p. 9)

While the randomized, controlled, double blind study provides the highest quality of evidence (D'Agostino & Kwan, 1995; Reay et al., 2009), generating such evidence on educational practices is not as straightforward as one might hope. Randomization in particular can present ethical and operational difficulties. For example, studies of online learning can be thwarted by student participants dropping their randomly assigned sections and re-enrolling in the sections they prefer. Other types of studies should not be completely ignored and may be useful if they are well controlled and interpreted with caution (D'Agostino & Kwan, 1995; Slavin, 2008).

Results

Institutional level

Intervention	Effect on Learning	Effect on Completion
Limiting class size	Positive. Increased class size is associated with decreased student academic performance. The optimal class size appears to be between10 and 15, while the point at which learning begins to deteriorate is between 10 and 25. The point of no return, beyond which increasing the number of students does little additional harm to learning, is in the range of 26 to 100 (Bandiera, Larcinese, & Rasul, 2010; Campbell, Jimenez, & Cruz Paul, 2013; Cuseo, 2007; De Paola &	Positive. Increases in student-faculty ratios account for over three-quarters of the decrease in completion rates relative to the 1970s (Bound, Lovenheim, & Turner, 2010). Level: 3

	Scoppa, 2011; Johnson, 2010; Kokkelenberg, Dillon, & Christy, 2008). Level: 3	
Using full-time faculty	Mostly positive. Contingent faculty on average spend significantly less time preparing for class and advising students (Umbach, 2008) and assign significantly higher grades (I. Johnson, 2011), which may reflect a more forgiving grading scale. Contingent instructors typically rely on high student evaluations for contract renewal and may not have departmental support to hold students to high standards. This is not to put any blame on contingent faculty; rather, the institutional support and incentives for contingent faculty are different from those for full-time faculty. One recent study at Northwestern, however, found that students of nontenure track instructors enjoyed improved learning outcomes (Figlio, Schapiro, & Soter, 2013). Level: 3	Positive. As exposure to part-time faculty increases, retention (Eagan & Jaeger, 2008; Jaeger & Eagan, 2011), graduation rates (Ehrenberg & Zhang, 2005), and likelihood of transfer (Kevin Eagan & Jaeger, 2009) decrease. However one study found no significance in the field of business (Bettinger & Long, 2010). This may reflect the type of adjunct; business schools often use working professionals. Other departments often rely on "freeway flyers," who are patching together several part-time jobs at various institutions. Level: 3
Intrusive advising/coaching	Positive. In one study students required to meet with academic mentors achieved higher grades in the same classes compared to students who were not assigned mentors (Sandner, 2013). Level: 3.	Positive. A randomized trial of the coaching services provided by InsideTrack showed that completion rates were 4 percent higher in the treatment group. (Bettinger & Baker, 2011). Level:2
First-year student success programs	Ineffective. The higher grades observed among participants in first-year success courses (e.g.Cho & Karp, 2012) appear to be due to self-selection variables (Pike, Hansen, & Lin, 2011). Level:3	Ineffective. A study of the Opening Doors program, using random assignment, found that the program did not improve students' graduation rates. Four years after the start of the study, around 7 percent of both the program and control group students had earned a degree or a certificate (Weiss, Brock, Sommo, Rudd, & Turner, 2011). Level: 1

Supplementing with intelligent tutoring systems	Promising. Experiments in intelligent tutoring systems have shown significant improvements in learning (Ghee Ming, Chai, & Maskell, 2010; Philippe, 2013). Level: 2	Unknown, but judicious use of intelligent tutoring systems might free up instructors for more numerous and smaller class sections.
Flipping the classroom. A flipped classroom is one where students absorb the basic material outside of class and then do an active assignment under the instructor's guidance.	Mixed to ineffective. Enthusiastic commentary abounds (e.g.Bergmann, 2012; Berrett, 2012), but there is little randomized research that compares learning outcomes (Bishop, 2013). Studies can be confounded by other variables such as simultaneous tightening of admissions standards (e.g. Moravec, Williams, Aguilar-Roca, & O'Dowd, 2010). One dissertation study found worse grades and less confidence in a "flipped" math class compared to a traditional course (Strayer, 2007). Another showed no clear benefit of a flipped classroom and increased off-task behavior (Johnson & Renner, 2012). Level: 2	Unknown.
Moving full-semester classes online	Negative. Despite a Department of Education report favorable to online courses (U.S. Department of Education, 2010), the effects of putting full semester courses online are negative (Jaggars & Bailey, 2010). A multisite observational study (Level 3) found a "robust negative impact of online course taking" for both English and math courses (Xu & Jaggars, 2011, p. 360). Level: 2	Negative. A review of the literature indicates that "online coursework—at least as it is currently and typically implemented—may hinder progression for low-income and underprepared students" (Jaggars, 2011, p. 2). Level:2

Instructor Level

The interventions below can be employed by individual instructors, independent of institutional policy.

Intervention	Effect on Learning	Effect on Completion
Spacing out practice on a topic over time.	Positive. Inserting a time interval between quizzes or practice sessions on the same material has long been known to have a beneficial effect on learning (Ebbinghaus, Ruger, & Bussenius, 1913). The "spacing effect" appears to increase both the amount of material learned and the length of time it is retained. Level: 2 (Dunlosky et al., 2013; Pashler et al., 2008; Pashler, Zarow, & Triplett, 2003; Pavlik & Anderson, 2008; Taylor & Rohrer, 2010).	Unknown
Incorporating frequent retrieval tasks such as quizzes	Positive. Retrieving information from memory with quizzes or flashcards, rather than just studying or rereading material, improves retention of material. Level: 2 (Butler, 2010; Dunlosky et al., 2013; Karpicke & Blunt, 2011; Pashler et al., 2008; Roediger & Karpicke, 2006; Vaughn & Rawson, 2011; Weinstein et al., 2010).	Unknown
Teaching to students' unique learning style	Ineffective. A systematic review of studies attempting to validate the learning styles approach found little to no evidence supporting this approach. There is no evidence that teaching a given subject using an individual's preferred style results in improved learning. (Pashler et al., 2008). Level:2	Unknown. There is no evidence of positive or negative effect on completion.
Bolstering student self-esteem	Negative. Compared to a similar control group, D and F students who received self-esteem-building messages had significantly decreased academic performance (Forsyth et al., 2007). Level: 2	Unknown, but given the negative effect on learning, it is unlikely to have a positive effect on completion.

Recommendations

Homegrown Assessment Is Not "Level One" Research

Faculty members are specialists in their own fields, but they do not necessarily have expertise in psychometrics or assessment. Thus, results derived from homegrown assessment efforts will generally fall quite low on the scale of rigor of evidence. Assessment may be viewed as similar to the diagnostic work physicians perform (Klimoski & Amos, 2012). The evidence- based approach to medicine requires the physician to seek the best cure (intervention) from all of the evidence available and to then use judgment and experience decide whether and how to implement it. Practicing physicians are not necessarily medical researchers, but they are expected to keep up with current research in their respective fields. Similarly, an evidence-based approach to continuous improvement would require administrators and educators to seek the best way to improve student learning (intervention) from all of the evidence available. Rarely would that intervention be identified and supported by homegrown assessment activities alone.

A Value Added Approach Accounts for Student Ability

Performance on the SAT, widely used for college admissions, predicts both grades and later career outcomes (DeAngelo, Franke, Hurtado, Pryor, & Tran, 2011). The SAT and similar tests are closely correlated with other measures of cognitive aptitude (Roediger & Karpicke, 2006), which remains the single best predictor of academic performance (Hambrick & Meinz, 2011; Kaufman, Reynolds, Liu, Kaufman, & McGrew, 2012). Because of this, less-selective institutions will always find themselves at a disadvantage in measures of student and alumni outcomes unless incoming student ability is taken into account (Higher Education Research Inst, 2003).

Attempts to level the playing field through remedial or developmental education have had very limited success. Randomized studies show little or no measurable effect on performance (e.g., Wagner, 2011), or at best, small gains for a high cost (Melguizo, Bos, & Prather, 2011). Remediation "might promote early persistence in college, but it does not necessarily help students on the margin of passing the placement cutoff make long-term progress toward earning a degree" (Calcagno & Long, 2008, p. 1). A large-scale observational study concluded that remedial education, despite its high cost, improved neither academic nor labor market outcomes (Martorell & McFarlin, 2011).

The optimal time for remediation appears to be in early childhood (F. A. Campbell et al., 2012; Muennig et al., 2011). The gap between children of affluent families and those of poor families is measurable well before age 2 (Taylor & Rohrer, 2010), indicating that efforts to catch up the children of less affluent families may need to begin in infancy.

Because the relationship between cognitive ability and academic performance appears strong and intractable, the "value added" approach appears to be gaining momentum (e.g., HCM Strategists, 2012; Liu, 2011; Thomas, 2010). This approach insures that institutions are not punished for having inclusive admissions policies.

Conclusion

An evidence-based approach to closing the loop requires us to study the relevant literature in search of rigorous evidence identifying and supporting such interventions and to base our decisions on that evidence. Indeed, the literature does support a number of interventions that are good candidates for improving student learning.

The use of an evidence-based approach should help to minimize inappropriate and/or ineffective interventions by reducing the likelihood of changes being made based solely on single-entity assessment data (which does not rank very high in quality of evidence) and by leading educators toward a more scientific approach. Perhaps one of the most damaging forces in education today is the pervasive pressure to "just change something!" when in fact the most appropriate position may very well be "first, do no harm."

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PERCEPTIONS OF BUSINESS COMMUNICATION STUDENTS ABOUT THE FLIPPED CLASSROOM

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Introduction

Much has been written about the flipped or inverted classroom being used as an alternative to the traditional classroom (Bergmann & Sams, 2012b; Berrett, 2012; National Business Education Association, 2012). Simply put, in a flipped classroom (Roehl, Reddy, & Shannon, 2013), instructors "assign the class lecture or instructional content as homework" (p. 45). By making these outside assignments, instructors are free to use class time to work closely with students to complete assignments and projects. Many of these in-class activities allow students to work collaboratively (Roehl et al., 2013).

How would students perceive the implementation of the flipped strategy in the business communication classroom?

Objectives of the Study

This study was conducted to determine the perceptions of business communication students about the flipped or inverted classroom strategy. Specifically, the study objectives included learning the reported level of student engagement with the flipped classroom strategy, the reported level of student learning with the flipped classroom strategy, the activities that students of flipped classrooms had experienced, the predicted level of student engagement with a flipped classroom, the activities students would prefer in the flipped classroom, and student preference about flipping the business communication course.

Review of the Literature

This section discusses the professional literature about the flipped classroom including benefits, considerations, and best practices for implementation of the inverted classroom strategy.

Benefits of flipping the classroom were enumerated by Bergmann and Sams (2012a) and include assisting busy students since content is not missed if a student is not in class, helping students who struggle by devoting time to them during class, allowing students with varying ability levels to master material, permitting rewinding of video and podcasts to reinforce concepts, expanding the interaction between students and teachers, and boosting the interaction between peers.

Prospective flipped teachers should contemplate the need for the following resources before implementing a flipped classroom strategy (Bergmann & Sams, 2012a): a network of other teachers who will provide support for the flipped classroom endeavor, administrative support to provide both encouragement and resources, Information Technology Department support to develop and maintain the flipped model, and time to master software and to create content in video and/or podcast formats. Typically, a video lasting 10 minutes requires 30 minutes of preparation time. Further, some risk is involved in using the flipped model of instruction. As Pardo, Perez-Sanagustin, Parada, and Leony (2012) asserted, *Relying on previous activities has the risk of students attending the lecture with significantly different levels of engagement. This risk is irrelevant in a conventional classroom as the material is assumed to be totally new to students; but if the lecture includes activities that rely on student participation, this risk seriously jeopardizes the success of the session (p. 1).*

Bergmann and Sams (2013/2014) developed the flipped-mastery model of education which enables students to complete content requirements flexibly. Mastery of the learning objectives must be demonstrated before students proceed to the next instructional unit.

There is little reported research about the results of flipped classrooms (Goodman & Miller, 2013). The Flipped Learning Network (2010) surveyed over 450 teachers experienced in the inverted classroom strategy. Over four-fifths of the respondents indicated that attitudes of students had increased positively, two-thirds of the respondents indicated that test scores had risen, and almost all of the respondents reported that next year they would flip a course. Lage, Platt, and Treglia (2000) found that students reported a preference for the inverted classroom compared with the traditional classroom. In addition, students reported that they would like the inverted classroom approach to be used in future economics courses.

Bowen (2012) argued that instructors need to use technology outside the classroom to enhance student learning.

We need to provide not only more content outside of class but also more and better ways to engage with that content. Asking students to read is not enough. Technology provides tools to motivate students for deeper critical exploration, application, and integration of the information now available to them, and e-communication provides strategies for building intellectual communities (p. 130).

Further, Fulton (2012) asserted that, "The use of technology is flexible and appropriate for 21st century learning" (p. 23).

Student perceptions of flipped classrooms grew more positive after completing a flipped actuarial course (Burt, 2014). After completing a flipped introduction to business course, student views of flipped classrooms were mixed (Findlay-Thompson & Mombourquette, 2014) while the learning achievement was similar to that of two introduction to business sections that were not flipped.

While Drage (2012) described how to use the flipped classroom strategy with challenge-based learning to enhance student achievement and instruction quality in the business education classroom, a review of the literature revealed no studies about using the flipped classroom strategy in business communication courses. As a result, this study was undertaken to fill part of the gap in the business education literature.

Research Questions

For the purpose of the study, six research questions were developed:

1. What is the reported level of student engagement with the flipped classroom strategy?
2. Of those students who had completed a flipped course, what is the reported level of student learning with the flipped classroom strategy?
3. What activities have students in flipped classrooms experienced?

4. For those students who had not experienced a flipped classroom, what is the predicted level of student engagement with a flipped course?
5. In the flipped classroom, which activities do students prefer to be flipped?
6. What is the reported student preference for flipping the business communication course at their institution?

Methods and Procedures Used to Collect Information/Data

After reading the professional literature, a 10-item survey was developed and reviewed by three business educators. Based on feedback received from these educators, the wording of two items was modified for clarity. The survey was piloted to determine if the items were sequenced correctly. No changes were needed after the piloting of the survey.

Students enrolled in seven sections (n=194) of business communication courses at two universities in the Western United States were surveyed about their experiences with and perceptions of the flipped classroom during the Fall 2013 term. The Statistical Package for the Social Sciences (SPSS) version 21 was used to calculate the statistics.

At both universities the business communication course is required of all business majors and is a writing intensive junior level course. The gender of the respondents was 76 females (39%) and 118 males (61%).

Results

A total of 95 respondents (49%) indicated they had taken a course that contained some elements of a flipped classroom, while 99 respondents (51%) reported that they had not taken a flipped class.

Research Question 1: What is the reported level of student engagement with the flipped classroom strategy?

Table 1 shows the level of engagement for students who had taken a course that contained some elements of a flipped classroom. Please note that the percentage total exceeds 100% due to rounding.

Table 1
Level of Student Engagement

	More engaged		About the same engagement		Less engaged	
	N	%	N	%	N	%
Students who have taken flipped classes	52	55%	32	34%	11	12%

Of those respondents who had experienced a flipped activity, over half of the respondents indicated they had been more engaged in the course.

Research Question 2: Of those students who had completed a flipped course, what is the reported level of student learning with the flipped classroom strategy?

The respondents were asked to describe their level of learning in the flipped classroom in comparison with a regular classroom. Table 2 shows that the majority of the respondents who had taken flipped classes had learned more in the flipped classroom than in a traditional classroom.

Table 2
Level of Student Learning

	Learned more		Learned the same		Learned less	
	N	**%**	**N**	**%**	**N**	**%**
Students who have taken flipped classes in comparison with a regular classroom	52	55%	31	33%	12	12%

Research Question 3: What activities have students in flipped classrooms experienced?

The assignments or activities used in the flipped classroom are shown in Table 3. The respondents were asked to indicate all activities in which they had participated; thus, the percentages total more than 100%.

Table 3
Activities or Assignments Used in the Classroom

Activity or Assignment	N	%
Writing assignments	61	64%
Projects	59	62%
Discussions	49	52%
Presentation assignments	45	47%
Other	13	14%

The assignments used in the flipped classroom favored writing, followed closely by projects. Over half of the respondents had participated in writing assignments, projects, and discussions.

Research Question 4: For those students who had not experienced a flipped classroom, what is the predicted level of student engagement with a flipped course?

Respondents who had not experienced a flipped classroom were asked what their perceived level of engagement would be if they were to experience a flipped classroom in comparison with their perceived level of engagement in a traditional classroom. Table 4 shows the responses about perceived level of student engagement.

Table 4 *Perceived Level of Student Engagement for Students Who Had Not Experienced a Flipped Classroom*						
	More engaged		**About the same engagement**		**Less engaged**	
	N	**%**	**N**	**%**	**N**	**%**
Students who had not taken flipped classes	65	66%	20	20%	14	14%

Those respondents who had not experienced a flipped classroom reported a perceived level of flipped course engagement that was more engaged than in the traditional classroom.

Research Question 5: In the flipped classroom, which activities do students prefer to be flipped?

The respondents were asked if they were to have a course that uses flipped activities, which ones would they prefer to be flipped. The most frequently selected activity selected by the respondents was projects as shown in Table 5. The respondents were asked to indicate all activities they perceived should be flipped; thus, the percentages total more than 100%.

Table 5 *Activities or Assignments That Should Be Flipped*		
Activity or Assignment	**N**	**%**
Projects	83	84%
Writing assignments	79	80%
Discussions	76	77%
Presentation assignments	71	72%
Other	17	18%

The respondents reversed the order of the activities that should be flipped in order of importance to projects first with writing assignments following closely in second place as compared to the activities presently experienced in a flipped classroom, which showed writing assignments first followed closely by project.

Research Question 6: What is the reported student preference for flipping the business communication course?

When asked if the business communication course at their campus should be flipped to maximize learning, 30% of the respondents indicated yes, 30% of the respondents indicated no, and 40% of the respondents reported that they did not know whether the course should be flipped.

Statistical Analysis. A one-way analysis of variance (ANOVA) was performed to determine if a statistically significant difference existed between genders in response to whether or not the business communication at their campus should be flipped. No statistically significant difference was found with $F = .684$ and $p = .506$. Therefore, it appears that gender does not influence the respondents' preference about having a flipped business communication class at their campus.

Discussion

Those respondents who had not experienced a flipped classroom reported a perceived level of flipped course engagement that was more engaged than in the traditional classroom. This increase in course engagement was similar to the increase reported by respondents who had experienced a flipped classroom.

Interestingly, the respondents who had not experienced flipping reversed the order of the activities that should be flipped in importance to projects first with writing assignments following closely in second place compared to the activities that were experienced in a flipped classroom, which showed writing assignments first followed closely by projects.

While gender does not appear to influence the respondents' preference about having a flipped business communication class at their campus, perhaps some students do not have sufficient knowledge about flipped classes to evaluate fairly whether or not they would want to have a flipped class on their campus. Additional education about flipped classrooms may make a difference in how these students might answer this question.

Recommendations

Based upon the findings of the study, the following recommendations are made:

1. The research questions should continue to be studied with additional sampling. Because the flipped classroom strategy is still in its beginning stages, students may not understand the benefits of flipping the classroom. As a result, instructors should introduce the concept of flipped or inverted classrooms to students.
2. A study should be conducted to determine the effectiveness of the flipped classroom with business communication students at both universities. While the reported study was a good first step in determining student experience with the flipped classroom as well as their perceptions of the flipped strategy, assessing the effect of flipping the classroom on student learning by gathering student performance data would add to the business education literature.
3. A study should be conducted to determine the influence that student demographics (gender, age, and class level) have on the effectiveness of the flipped classroom with business communication students at both universities.

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PERCEPTIONS OF INCOMING STUDENTS REGARDING THE INFORMATION TECHNOLOGY/COMPUTING MAJOR— AN EXPLORATORY STUDY

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Introduction

Information Systems (IS) and other computing related fields have witnessed declining student enrollments (Vilvovsky, Fedorowicz, & Golibersuch, 2008). Enrollments have been on decline in IS programs for a while even though the industry employment outlook remains good. Information Technology (IT) careers are expected to be the fastest growing and highest paying careers in the next decade (Akbulut & Looney 2007). IT workers are essential to every modern business model (Veronica, 2013). Employment of computer systems analysts is expected to grow 22 percent from 2010 to 2020, faster than the average of all occupations (Bureau of Labor Statistics, 2013). Growth in wireless and mobile networks will create a need for new systems. Technology jobs are predicted to grow at a faster rate than all other jobs in the professional sector, up to 22 percent over the next decade, according to the Bureau of Labor Statistics. Labor trends show that 1.4 million computer-related jobs will be added in the U.S. by 2018, according to the U.S. Department of Labor and the Bureau of Labor Statistics. The top ten leading fields in the IT field are IT consultant, cloud architect, computer forensic investigator, health IT specialist, mobile application developer, web developer, software engineer, information technology vendor manager, geospatial professionals, and data modeler. Information technology workers are highly specialized in their field. They like what they do and understand it (Top 10 Jobs in Information Technology, 2013).

A better understanding of perception of today's students about computing would help in restructuring pedagogy and curricula in order to attract more students in this field. We need to better understand the educational environment, especially at the middle school and the high school level, in order to generate student interest about technology related preferences, habits and interests (Vilvovsky et al., 2008). The purpose of this paper is to study the perceptions of incoming students regarding the Information Technology/Computing major. The research questions that this study addresses are:

RQ1: What are the perceptions of incoming students about the information technology/computing field?

RQ2: What can we do to encourage enrollment in college information technology/computing programs?

The rest of this paper is organized as follows. The next section presents an analysis of existing research literature in the area of information technology/computing. The section following the literature review presents the methodology used for this study including data collection and data analysis. The discussions from the findings from our data are presented in section four followed by the conclusions for this study.

Literature Review

The enrollment issue in IS has been discussed and researched for several years now. This is a critical problem, and the consequences of ignoring the low enrollment problem are severe indeed. IS programs have been eliminated or disbanded, and tenured faculty have been laid off (Glass, 2007). The severity of this crisis can be gauged by the fact that Florida State University eliminated its highly-regarded IS department and merged it into management; whereas, the University of Central Florida eliminated IS programs (bachelor's, master's, and doctoral), shutting down the department, and terminating the contracts of all faculty, including tenured full professors (Koch, Van Slyke, Watson, Wells, & Wilson, 2010).

McInerney and DiDonato (2008) conducted focus group interviews of information technology students and found that the major influences in choosing a computing major were positive experiences in high school, an aptitude for math, perceived job prestige, encouragement of family members, and key teacher input. Students did not have the negative stereotypes and attitudes toward the field. Research in this area consistently suggests that lack of K-12 computing courses at middle and high school level, lack of accurate career information about computing related careers, and absence of mentors in the field all play a role in inadvertently turning young students away from the industry (Akbulut & Looney, 2007).

There have been several studies in this area to understand the underlying social and cultural dynamics behind this IS situation. Leidner and Kayworth (2006) presented a review of 82 research studies of the organizational and cross-cultural IT literature that links culture with IT. The authors propose that culture in general is a critical variable in explaining how social groups interact with IT and that there is a gap in the literature in defining the values, attitudes, and enculturation in IT (Leidner & Kayworth, 2006).

Administrators at universities have been working on solutions to this delicate problem of declining enrollment in IS. In order to address this problem, it is important to understand the factors that facilitate and impede the attraction, recruitment, and retention of IS majors. It is important, in this context, to understand the underlying perceptions of incoming freshmen students (both IS majors and non-IS majors) about what the information systems discipline is all about. Good IT students need basic analytical skills and concentrated interests in science, technology and math, and computer technology encompassing the K-12 level is a necessary component (Bright, 2007). Increasing IS enrollment requires partnering with a variety of external stakeholders to make them aware of the IS enrollment problem and to ask for their help addressing the problem (Koch et al., 2010). These stakeholders could include other disciplines in the school, current majors who are in the program, career services and potential employers.

It is also important to develop program-building initiatives to develop a strong bond between the program and the students. An important step towards this relationship building would be empowering current students with the responsibilities of educating and attracting non IS majors to IS programs. IS majors can provide key insights into designing events that appeal to freshman students. Opportunity, empowerment, and recognition are three of the best incentives that help in motivating student commitment (Koch et al., 2010).

Research Methodology

Methodology

This study used a cross-sectional survey to collect data by asking all of the students in four sections of INFS1020 Introduction to Decision Support Systems at a private four-year institution in southwestern PA about their perceptions of the IT/computing field. The goal of descriptive surveys is to get a snapshot or to describe your respondents by gathering: demographic information, personal information, and attitudinal information. Exploratory research is conducted to provide a better understanding of a situation.

The cross-sectional design is effective for providing a snapshot of the current behaviors, attitudes, and beliefs in a population. A cross-sectional survey is one in which data are collected from selected individuals at a single point in time (Gay, Mills, & Airasian, 2009).

Data Collection

All of the students in four sections of INFS1020 Introduction to Decision Support Systems were surveyed, totaling 94 students. There were 60 males and 34 females. Of the group surveyed, 57 were freshmen; 24 sophomores; 10 juniors; and 3 seniors.

Our goal was to find out from incoming students their perception about information technology/computing. Even though we had two main questions that we needed to ask, we added more questions to generate their perceptions about the topic. The questions were as follows:

1. How did you select your current major?
2. Have you ever considered a career in the information technology field? Why or why not?
3. In what ways did various people provide personal advice/information about your career choice?
4. How would you define information technology/computing?
5. What jobs come to mind when you think of information technology/computing?
6. What specific technology skills are required by your chosen major?

Data Analysis

Several majors were reported by the group (see Table 1). Some of the majors did not make the top six; however, they should be mentioned. They are as follows: finance, cyber forensics, psychology, CIS, and graphics/media arts/TV production.

Table 1
Majors Identified

Engineering	Psychology
Business	Cyber Forensics
Accounting	Graphics/Media Arts
Actuarial Science	Sport Management
Biology	Education
Communications	Hospitality & Tourism
Finance	Marketing
CIS	Economics

In response to question 1 about how did they select that major, parental advice/family had the most impact on their decisions, with employment opportunities following close behind (see Table 2).

Table 2 *Selection of Major*
Parental advice/family
Employment opportunities
High school teacher
Personal interest for many years

In response to question 2 about whether they ever considered a career in the information technology field, 65 responded no and 29 responded yes. The reasons why or why not they considered the IT field are listed in Tables 3 and 4.

Table 3 *Why Did You Consider the IT Field?*
Enjoy working with computers and technology
Information technology field is a growing career
Money
Requires math, which is best subject

Table 4 *Why Did You Not Consider the IT Field?*
Does not personally interest me
Not interested in learning computer programs
Haven't heard much about it; don't know what it is
Not good with computers
Don't want a cubicle job

In response to question 3 concerning in what ways did various people provide personal advice/information about their career choice, the responses were generally positive with 37 responding Somewhat Helpful and 9 Very Helpful about providing personal encouragement about selecting courses towards their career choice. In response to providing personal advice/information about their career choice, the responses were generally split between Somewhat Helpful and Very Little. The same responses were found when asked about providing information about the employment outlook for their career choice. The majority responded Somewhat Helpful and then the responses were Not At All and Very Little.

In response to question 4 about defining information technology/computing, the responses were short because it was an open-ended question (see Table 5).

Table 5 *Definition of Information Technology/Computing*
Dealing with any type of computer or technology
Using the latest technology and computers to create new things to make life easier
Dealing with technology in today's society and using it to do daily things
An area of work that deals with computers and technology to process information and make it useful
Coding software to collect data

In response to discussion question 5 asking what jobs come to mind when you think of IT/Computing, the standard positions were identified—programmer, technical support, etc. (see Table 6).

Table 6 ***What Jobs Come to Mind When You Think of Information Technology/Computing****?*
Programmer
Technical support
Software engineer
Web developer/designer
Systems analyst
Database manager

In response to question 6, what specific technology skills are required by your chosen major, the majority said basic computer skills (see Table 7). However, basic computer skills were not explained in detail.

Table 7 ***What Specific IT Skills are Required by Your Current Major?***
Basic computer skills
Excel (spreadsheets)
Microsoft Office
Don't know

Discussion and Recommendations

This study presents the survey results about the perceptions of incoming students about the information technology/computing major. The methodology of conducting this study, along with the results, is presented. Recommendations are provided to identify ways for educators and family members to encourage students interested in the IT field and to encourage enrollment in the college information technology/computing programs. We recognize that confusion about the definition of information technology/computing, the negative connotation of the IT field, and lack of awareness concerning technology are three areas of concern that we will discuss below.

Confusion about the Definition of Information Systems/Information Technology

In reviewing the survey results, there was confusion about this definition. There is a broad disagreement about the definition of information systems. This varying conception of information technology surfaced in our survey, and we believe that this has deeper consequences than it appears to have. The field of information systems is increasingly enduring a credibility crisis (Somers, 2010); i.e., what is information systems or how is it different from information technology? The confusion regarding the IS discipline is evident in the variety of schools and colleges that house IS programs: colleges of computing, information, library science, and computer science, as well as business schools (Somers, 2010). This confusion of identity manifests itself in declining enrollments, under appreciation of value of IS, and questions about relevance of IS (Firth et al, 2011).

Computer information systems can be viewed as the process of development, installation, and implementation of computer systems and applications. The survey group primarily viewed it as dealing with any type of computer or technology. The bigger picture of computing was missing—the whole idea that computing is the ability to access, evaluate, use, and manage information, regardless of career choice. This myopic perception of the technology field inadvertently limits the scope of education and career options of the students. There is a plethora of career opportunities in the technology field, which could be appealing to students, provided they understand and explore these possibilities.

IS needs a repositioning in the minds of students enrolling in universities. It is important to establish that a sound knowledge base about IS would help in multiple professions and disciplines. Having a basic understanding of information systems will make students of all disciplines a better "consumer of technology" in their chosen field of major or profession. This "value added" perspective of IS can work with employers or other departments to design courses suiting different majors. The need of the hour is to create IS courses that serve the needs of IS majors as well as add value to other programs.

Negative Connotation of the IS Field

Our data suggests that students have a limited and rather technical perception about information systems major and career. The issue may have to do with cultural norms and the stereotype of who works in IT. This finding is consistent with what other researchers in this domain are suggesting about negative perception of the field (Granger, Dick, Jacobson, & van Slyke,2007; Lomerson & Pollacia, 2006) deter students from taking up the major. The general image of IS majors is that of nerds sitting in front of computers all day. Work of IS professionals is perceived to involve extensive programming requiring long hours combined with constant pressure of keeping up with new technology and upgrading skills (Joshi, Kvasny, McPherson, Trauth, Kulturel-Konak & Mahar, 2010). High school and business school students have reported that they consider IT related careers as highly technical in nature that require an aptitude that they do not possess (Lomerson & Pollacia, 2006). Negative stereotypes of the IT profession abound: being geeky, nerdy, and that the IT jobs require sitting in front of the computer all day (Patnayakuni, Patnayakuni, & Orman, 2010). This leads the students to believe that coursework in IT is hard and does not match their personality types and capabilities.

Some of the typical stereotypes about a person working in IT are "nerd," "geek," and "introvert." Some of the misconceptions include IT people don't understand business and IT people lack social skills. In order to eliminate the negative connotations, one must first become aware of them. Overcoming the stereotype of the "tech geek" may take some time. Success in the industry is framed as being dependent on expertise (Ura, 2012), and the best way to address the problem is by addressing this culture and reestablishing what computing is. Stereotype threats influence choices and aspirations.

We recommend that it is important to proactively take on these myths or false perceptions head-on. More awareness about this topic would lead to a changed perception of the field. It is a core functionality of an organization and requires communication and managerial skills to succeed just like any other functionality in the organization. Research suggests that students when exposed to IS are able to recognize the changing nature of IS and that it requires managerial, communication, and problem-solving skills in addition to technical knowledge (Joshi et al., 2010). Advertising and promotion activities, along with the knowledge and awareness of the academic advisors about the IS profession, have the potential of educating students in a shorter period of time (Granger et al., 2007).

It is beneficial for us at universities to develop early intervention strategies for students at the high school level and get them excited about IS prospects. The IS department at this school has been proactive in interacting with high schools. We hosted a half day "Information Systems Event" where high school teachers and guidance counselors were invited. Different aspects of IS education was highlighted with small giveaways for the attendees.

Lack of Awareness Concerning Technology Use in Their Chosen Major

Almost all jobs now require some basic understanding of computer hardware and software, especially word processing, spreadsheets, and e-mail (Hansen & Hansen, 2013). The top ten "valued" workplace skills include communication, organizational, computer, interpersonal, analytical, leadership, problem solving, time management, mathematical, and professional skills (Top 10 valued workplace skills, 2013). Technology literacy is a requirement of all work environments. Technology literacy means being able to evaluate new technologies and how to use the new tools. It stresses applying technology effectively. Using technology to gather, analyze, and synthesize information is a basic requirement of any organization.

This trend towards a negative effort/risk and reward perception of technology related fields may be emblematic of the general decline in enrollment in all Science, Technology, Engineering and Mathematics (STEM) related fields (Patnayakuni et al., 2010). Thus, declining enrollments have to a large extent been attributed to this gap between perception and market conditions. Joshi et al. (2010) suggest that the students do not perceive that business and organizational skills such as leadership and customer and relationship skills are critical to succeed in IT careers. The students feel that a strong technical understanding is required to get into IS fields. This suggests an opportunity for developing interventions and strategies that can help to attract students who have good nontechnical skills.

Literacy skills help students gain knowledge through reading as well as using media and technology. Information literacy involves traditional skills, such as reading, researching, and writing, but now there are new ways to read and write. The new skills are consuming information and producing information. Consuming information means taking information, checking it for bias and errors, and making sense of the information. Producing information means understanding what is written, being professional, and learning to be effective and ethical producers of information (Thoughtful Learning, 2013).

According to the Center for 21st Century Skills at Education Connection (2013), six critical skills that form the foundation for 21st century success are information literacy, creativity and innovation, collaboration, problem solving, communication, and responsible citizenship. Information literacy is using appropriate applied research to any problem and the ability to find useful and reliable information. Responsible citizenship means demonstrating the proper use of technology, global awareness, and moral capacity. Two of the six critical skills relate to IT.

Awareness about information systems opportunities, its role in today's business operations, and most importantly the job prospects in IS fields is the first step towards dealing with this "Why do I need to learn this?" about IS. These awareness campaigns need to address common myths about IS, and the most important message in the awareness campaigns is the positive job outlook for IS graduates (Koch et al., 2010). Based on our survey results, we propose the following recommendations be made (see Table 8 on page 26).

In summary, the confusion about what information technology/computing really is may have prevented incoming students from entering the IT field. Some of the misconceptions about the IT field may have kept young people from seeking a career in information technology/computing. Finally, the lack of awareness about technology use regardless of chosen career may have played a role in not selecting IT as their major. More collaboration with middle school, high school, and universities is required to address these concerns and myths about IS/computing at a fundamental level. Becker and Thompson (2009) suggest that the collaboration and open discussion that bridges the gap between secondary, postsecondary, and the high demand technical workplace to achieve a rigor and relevant seamless education environment that is quality-based are essential. The input from business and industry will provide the real world skills and knowledge necessary for meeting the global market and the professional standards that should be the foundation of IS curriculum.

Table 8
Recommendations

Research Questions	Findings	Recommendations
What are the perceptions of incoming students about the information technology/ computing field?	1. Much confusion about what IT/computing is 2. Negative connotation about the IT field 3. General lack of awareness about technology use in their chosen majors	1. Teachers or guidance counselors must provide personal encouragement to students interested in technology careers. 2. The students must be made aware of what IT is and what you do in the field through providing information sessions, role models, guest lecturers, etc. for the middle and secondary classrooms. 3. Change the stereotype of sitting in a cubicle isolated from the rest of the employees.
What can we do to encourage enrollment in college information technology/computing programs?	1. Develop a consistent message about IT (definition and opportunities) 2. Develop a positive awareness about the IT field 3. Stress the 21st century workforce skills/literacy necessary for success in all professions	1. Secondary schools and higher education need to work together to develop an IT career awareness that has a consistent message for potential students. 2. Parents/family need to be informed about what IT is and the employment outlook for this career choice. 3. Higher education can provide role models, job shadowing, and/or field experiences for young people.

This study contributes to the body of knowledge in several ways. First, we recommend ways that educators and family members can encourage students who are interested in IT and help them make informed decisions about their career choice. Second, this study identifies specific ways to encourage enrollment in college IT/computing programs. With technology jobs predicted to grow at a faster rate than all other jobs in the professional sector, we have a responsibility to develop a positive awareness about the field.

Conclusions

This study clearly suggests that changes need to be made in order for more young people to enter the IT/computing field. This paper is targeted at the perceptions of incoming students about the IT/computing field. Information was gathered through a survey, which asked both closed- and open-ended questions to understand their perceptions. It is evident that teachers and/or guidance counselors need to help students make career choices, along with parents and/or family. All of the strategies presented in this paper can work to attract students in the short run but to improve and sustain more enrollments in IS programs, a long-term commitment from the administration at the universities is required. The students who choose to enroll need to get a satisfying experience and stay with the program.

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CHARACTERISTICS OF HIGH ACHIEVING STUDENTS ENROLLED IN AN ONLINE ECONOMICS COURSE

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The ease in accessing classes online through the use of a computer or other more mobile devices offers students flexibility and control by providing them the freedom to arrange courses around their lives, not by the geography of the place they reside. For instance, the high school student who is interested in a career in technology and/or business does not have to be content in taking only that one business and/or technology course that is offered within the confines of his/her school walls. These students can now choose to take courses in their field of interest from other schools and institutions around the country. This provides many students the opportunity to enroll in business courses when they are not offered in their local setting. To best prepare instructional programs and curricula that are effective via online delivery and to best prepare students for the online learning experience, it is important to understand the characteristics of the successful online learner.

Over the past several years, institutions of higher learning have realized the value in offering online courses for students, and their students have come to rely on the availability for online courses as they work toward their academic goals. There has been a growing movement to expand this mode of course delivery to students in grades K-12, but particularly in high schools.

It is important to note that there is a difference between postsecondary and secondary students. One noted difference can affect student self-motivation; students in postsecondary education have chosen to continue their academic pursuits, while students in grades K-12 have mandatory state attendance requirements. It is essential to recognize and distinguish between these two groups when attempting to apply findings from studies conducted on students in the postsecondary grades to students in secondary grades. This study describes characteristics of the top performing high school students who were enrolled in an online economics course in relation to self-motivation and self-regulation. This study is important to computer and technology educators, as well as business educators, to understand the needs of *every* student who chooses online learning, not only in required courses, but also courses in their field of interest; not only postsecondary students, but also secondary students.

As more people learn and complete coursework online, there has been increasing interest by the scientific community to better understand this new learning environment and the impact it has for the online learner. This knowledge contributes to the ability to develop and implement best practices within the online teaching community. There have been many studies regarding online learning that address the online postsecondary student. The findings from these studies demonstrate a strong relationship between motivational beliefs and self-regulation and are positively associated with increased academic performance levels. However, relatively few studies have been published that investigated students in primary and/or secondary grades learning within this medium. As the availability and popularity for online learning increases for students in grades K-12, particularly in high schools, it is important to determine whether high school students are prepared to take online courses. The purpose of this study was to examine the relationship between self-motivation and self-regulation and academic performance using end-of-course grades in high school students enrolled in an online course in economics.

The Evergreen Education Group, in their "Keeping Pace With K-12 Online and Blended Learning in Grades K-12" (Watson, Murin, Vashaw, Gemin & Rapp, 2012) report, described the increase of high school students enrolled in state virtual schools. The report provides evidence that online learning continues to grow, with many states having an annual growth rate of 40% or higher (see Table 1).

Table 1
Sample of States with Prominent State Virtual Schools

State Virtual School	Course Enrollments	Annual Growth	Ratio to State Population
Florida Virtual School	303,329	+17%	38.7
New Hampshire Virtual Learning Academy	15,558	+35%	24.2
North Carolina Virtual Public School	97,170	+10%	22.6
Idaho Digital Learning	17,627	+22%	21.6
Alabama ACCESS	44,332	+31%	20.2
Montana Digital Academy	6,797	+49%	15.5
South Carolina Virtual School Program	15,831	+41%	7.5
Georgia Virtual School	20,876	+45%	4.4
Michigan Virtual School	19,822	+12%	3.7

Note. Source: State high school population, http://nces.ed.gov.programs/stateprofiles/

A state virtual school is but one type of online learning environment available to students K-12 nationwide. Watson et al. (2012) list several "defining dimensions" (p. 10) of online programs that include supplemental programs, full-time schools, "organizational type," and "operational control" (p. 10), which will be discussed in more detail later in this paper.

In 2010 former Florida governor and current chairman for the Foundation for Excellence in Education, Jeb Bush, brought 100 leaders together with backgrounds in education, government, business, technology, and philanthropy to focus on ways to reform and transform this country's public schools through the use of technology. This assembly, called the Digital Learning Council (DLC), published its findings in a report entitled *"Digital Learning Now."* The DLC recommends that every public school student have access to online courses in order to provide a more student-centered approach to academic progress. In its report, the DLC writes that "[d]igital learning offers the potential for students to study at their own pace and advance based upon competency and mastery of the material" (Excellence in Education Foundation, 2010). The DLC determined that public schools have remained unchanged since the 1950s and no longer reflect the society from which its students belong. The DLC reports that students still sit in brick and mortar school buildings reading "outdated" (p.4) textbooks for a "set number of hours on a set number of days based primarily on an agrarian calendar" (Excellence in Education Foundation, 2010, p. 4).

Today, the DLC continues to challenge public schools to transform classrooms through technology and implement digital learning in grades K-12 to better meet the needs of the modern student. The DLC is not alone in its quest for digital learning as a common mode of course delivery in public schools. In May 2012, the Center for Public Education, National School Boards Association (CPE) published its report regarding online learning and stated that "[t]he place of digital content in public education is therefore not a matter of debate; it is inevitable" (p. 1).

Theoretical Framework

One of the foundational goals in teaching students in career and technical education, as well as business education, is to transfer responsibility of learning onto the student and away from the instructor so that graduates in these areas have the skills and knowledge to be successful and productive entrepreneurs, business owners, and/or employees, as well as being able to contribute to society through economic citizenship. A review of literature in this area supports the theory that students who become active agents in their own learning processes achieve a higher level of academic success than those students who are more passive players in their own learning. Research shows that those students who retain their motivation level through tasks complete the many academic and life tasks/goals required. Students who also regulate (control) their own emotions in the face of frustration during the process, while employing learned cognitive strategies, achieve a higher academic performance level than the students with low levels of self-motivation and self-regulated learning.

A student who is able to organize and regulate his/her behavior when progressing toward a specific goal is said to be engaged in self-regulated learning (Pintrich, 2004; Schunk & Zimmerman, 2008; Zimmerman, 2002). There have been many empirical studies that have shown when a student engages in self-regulated learning (SRL) s/he achieve a higher level of performance than those students who do not engage at all or who only use some of the elements of SRL (Pintrich, 2004; Ridley, Schutz, Glanz & Weinstein, 1992; Schunk & Zimmerman, 2008; Winters et al., 2008; Zimmerman 2002). The center of this process is the behavior of the student. Self-regulating behavior is the key to the level of success the student will achieve in reaching his/her goal. Many researchers studied the specific elements that define, influence, and motivate student engagement of self-regulated learning with varying conclusions. However, most can agree that self-regulated learning is an active, cyclical process that involves cognition, motivation, behavior, and context.

Schunk and Zimmerman (2008) define a person who is capable of self-regulated learning (or self-regulation) as one who can undertake the process by which learners personally activate and sustain cognitions, affects, and behaviors that are systematically oriented toward the attainment of learning goals. In other words, a self-regulated learner knows how to create a plan to reach the learning goal and can engage in self-control during the progression of working on the tasks to reach the goal, even when it becomes difficult. Throughout the process, the student assesses whether the planned task/goal had been attained as initially set forth. This self-evaluation serves to determine whether the process and results were satisfactory or whether the process requires change. This process of self-reflection also serves as a motivator for that student to continue to use self-regulation when tackling future tasks based upon a perceived alignment to the initial plan.

Purpose and Objectives

The purpose of this study was to examine the learning characteristics of high-achieving students enrolled in an online economics course during the summer of 2013; specifically, to examine the relationship between academic performance of these secondary students and their perceived levels of self-motivation and self-regulation. The three components of self-motivation are (i) internal value, (ii) self-efficacy, and (iii) test anxiety. Internal value component is how the student assesses the importance of this course to their own goals, and self-efficacy relates to the student's belief that s/he is able to do the tasks of the course, while a student's perceived level of test anxiety seeks to measure the affective response to the tasks of the course. The two components of self-regulation are (i) control and (ii) cognitive strategy use. Control is measured in the way a student perceives his/her ability to manage and control effort when working on any required task and the perceived ability to focus on the task at hand without being distracted by outside influences or diversions.

The student's perceived study habits and use of learning strategies when taking a course is measured by the cognitive strategy use component of self-regulation. Objectives of this study were to:

1. Describe the self-motivation profile of the high achieving student in an online economic course.
2. Describe the self-regulation profile of the high achieving student in an online economic course.

Methodology

The study methodology involved a descriptive research design utilizing the census survey method. The population of the study consisted of 441 students (N = 441) students enrolled in a summer course for high school students called Economics 301. One-hundred twenty-one (n = 121) participants completed a survey instrument designed to assess their learning characters as they relate to motivation and self-regulation; however, four of those surveyed withdrew from the course, resulting in 117 usable surveys. All participants were contacted through their school e-mail accounts. Because of the use of a census method, sampling methods were not used; thus, generalizability is limited to the participants within the study. High achieving students were defined as those who received a grade of a 90% or higher (M=94.95, n = 55).

The data were collected through a 45-item survey instrument based on Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, 1991) as well as an end-of-course 32-item survey generated by the online course provider requesting information on student demographics and other information pertinent to this provider; for example, satisfaction of course delivery, etc. The MSLQ was opened during a 4-week window to students enrolled in an online summer course in economics at the beginning of the course. The students were to rate their self-motivation and self-regulation on Likert type response scales (1=Never,...4=Always).

Within the construct of self-motivation, questions were focused on its components, intrinsic value, self-efficacy, and test anxiety. A few of the statements that were associated with internal value were "I prefer classwork that is challenging so I can learn new things" and "Understanding this subject is important to me." Some samples of statements associated with self-efficacy were "Compared with other students in this class, I think I'm a good student" and "I'm certain I can understand the ideas taught to me in this course," while statements associated with test anxiety were negatively posited, "When I take a test, I think about how poorly I am doing" and "I am so nervous during a test that I cannot remember facts I have learned."

Within the construct of self-regulation, questions focused on the control component and cognitive strategy use component. Statements for control were constructed in statements such as "I find that when I'm reading online material, I think of other things and become distracted" and "Even when study materials are dull and uninteresting, I keep working until I finish." Those statements focused on cognitive strategy use involved metacognition, such as: "When studying, I copy my notes over to help me remember material" and "When I am studying a topic, I try to make everything fit together."

Findings and Results

There were 55 (n = 55) out of the 117 surveyed participants who received a final grade of 90% or above (M = 94.96, sd = 4.21) for the Economics 301 online course. Out of the 55 high achieving students taking economics online, 37 were female and 12 were male, six students in the high achieving bracket were nonresponsive to the end of course survey sent by the online service provider. The ages ranged from 15 years old (2 students) to 18 years old (one student), but fell generally within 17 years old (30 students).

This online course was offered to all districts throughout the state of [*state name*]. The participants came from schools districts where total enrollment ranged from 128 students up to over 36,000 students. Most of the high achievers in the study came from one of the very large school districts with an enrollment of over 25,000 students. When asked to select the reasons (students were allowed to select more than one reason) for taking the economics course online, 44 students gave the reason of a scheduling conflict and 13 indicated that it was their desire to move ahead at a quicker pace or to graduate early.

Objective 1. Describe the self-motivation profile of the high achieving student in an online economic course.

High achieving students rated the internal value for this online course above 2.5 (M = 2.96, sd=.51). The range was 2.22, with the minimum score of 1.67 and maximum of 3.89. The average score in the component of self-efficacy was above 3.0 (M = 3.33, sd = .38). The range was 1.78 (2.22-4.00). The high achieving student rated test anxiety at a level below 2.0 (M = 1.86, sd = .70). The range was 2.75 (1.00-3.75).

Objective 2. Describe the self-regulation profile of the high achieving student in an online economic course.

Within the self-regulation construct, high achievers in an online economics class perceived the control component near 3.0 (M = 2.97, sd = .33). The range was 1.33 (2.22-3.56). The self-regulation component of cognitive strategy use was near 3.0 (M = 2.90, sd = .41). The range was 1.69 (2.09-3.77).

Conclusions and Recommendations

Two components of self-motivation, self-efficacy, and test anxiety seem to describe the high achieving student in the online economics course. These students demonstrate a high level of self-efficacy and a low level of test anxiety. The average high achieving student in an online economics course perceived themselves with a high level of self-efficacy (3.33) and low test anxiety (1.86) and above average internal value for the course (2.96). The student who achieves a high level of achievement in an online course has a high level of control (2.97) and cognitive strategy use (2.90), although not quite as high as self-efficacy. From these findings, it appears that the two sub processes that may have the most positive influence on high achieving students in an economics class are self-efficacy and low test anxiety.

These findings can inform educators of online pedagogy and course development. With this information educators can structure their online courses in such a way that students become self-efficacious within this structure through positive and immediate feedback on coursework. If immediacy is a problem, then the educator can provide a given time frame when feedback can be expected by the student. Another way to use this information is for the educator to recognize the negative impact of test anxiety on student achievement and introduce study guides, weekly quizzes, or other methods of assessments. Further, the educator can strengthen internal value of the online course by making meaningful connections to future use of its concepts.

The findings not only provide guidance for those who may be teaching or designing online courses but may also serve to prepare students before they enroll in an online program. Schools may develop preparation courses informed from this study to help students develop the characteristics needed to be successful. Through this process, students have the opportunity to analyze and reflect upon their own characteristics and, therefore, be better able to make decisions about which courses they choose to engage with.

Significance of the Study

A review of literature found few empirical studies that analyzed the perspectives of high- achieving students in an online course regarding their perceived self-regulation and self-motivation. This study's objectives were to describe the characteristics of high-achieving students enrolled in an online economics course and to examine the relationship between the sub processes of self-regulation, self-motivation, and academic performance.

This study adds to the body of knowledge in this relatively new area of online learning for secondary grade students. The findings suggest that the student who will achieve a successful outcome in an online learning environment should possess a high level of self-efficacy and knowledge of learning strategies. Further, it is the self-efficacious student who appears to have a lower level of test anxiety that leads to higher academic performance. Further studies need to be conducted in this area to determine patterns of characteristics in high achieving students in online environments, not limited to economics.

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INSTRUCTIONAL STRATEGY USE IN THE P-12 BUSINESS AND MARKETING EDUCATION CLASSROOM

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Both career and technical education (CTE) and academic teachers face considerable challenges in the contemporary P-12 classroom environment. Prior research has indicated the most critical predictor of P-12 students' achievement is the effectiveness of the classroom teacher (Auguste, Kihn, & Miller, 2010; Banks, Cochran-Smith, Moll, Richert, Zeichner, LePage, et al., 2005). However, the current state of affairs in public schools is quite problematic given the fact that high poverty urban schools, which oftentimes house large numbers of ethnic and racial minority students, are most likely to struggle in terms of attracting quality and effective teachers (Auguste et al., 2010; Smith & Smith, 2006). This is an even larger issue for CTE teachers because a large percentage have little to no formal teacher preparation and instead come through alternative pathways, particularly in respect to trade and industry teachers (Bruening, Scanlon, Hodes, Dhital, Shao, & Liu, 2001; Fletcher & Zirkle, 2010; Zirkle, Fletcher, Sander, & Briggs, 2010).

Further, contemporary P-12 classrooms are comprised of students from a wide array of learning orientations as well as ethnic, racial, and linguistic backgrounds which lead to culturally diverse CTE programs (Rehm, 2008; Rayfield, Croom, Stair, & Murray, 2011). In terms of diverse ethnic and racial backgrounds of students, 41% of P-12 students were of color, while only 16.5% of their teachers were from similar racial and ethnic backgrounds (Ingersoll & May, 2011). In fact, African-American students comprise 20% of the national student population, while African-American male teachers only account for 1% (Lewis, 2006). And, African-American students are significantly more likely to participate in CTE and dual tracks compared to their White counterparts (Fletcher & Zirkle, 2009).

Beyond working with an increasingly diverse student population and having a large percentage of teachers with less teacher training compared to academic teachers, CTE teachers are faced with expanded roles and responsibilities to ensure their students are equipped with a much broader range of skills--including those which make their students college and career ready (Bottoms, Egleson, Sass, & Uhn, 2013; Cannon, Kitchel, & Duncan, 2013). Among the varied roles and responsibilities of current CTE teachers are (a) career development--equipping students with an understanding of a variety of employment opportunities which are available post high school; (b) preparing students to meet higher academic achievement standards through curricular integration with subjects such as math and science as well as equipping students with 21st Century workforce skills; and (c) updating curricula to reflect changing workforce demands (McCaslin & Parks, 2002).

Because CTE teachers must prepare an increasingly diverse group of students in terms of ethnic and racial backgrounds, linguistic backgrounds, and learning needs, as well as assist students to meet higher levels of academic performance, it is important to understand what pedagogical approaches CTE teachers are implementing in their classrooms to accommodate their ever-diverse student body and to make the content comprehensible and meaningful to an array of student learning needs. To that end, Rehm (2008) noted:

> *Existing trends and studies have indicated that CTE teachers in the Twenty-first Century must approach their teaching with sensitivity to students from diverse linguistic and cultural*

backgrounds, build cooperative and dialogical skills, teach essential knowledge to students with various levels of proficiency with English, and maintain industry and educational standards. Although these challenges can seem daunting, individuals and the nation will benefit if teachers assume them with awareness and understanding. (p. 49)

However, there is limited empirical research within the field of CTE related to the issue of how CTE teachers are adapting to the diverse needs of their students. In fact, McCaslin and Parks (2002) emphasized "an inadequate knowledge base is available regarding what the career and technical education teacher does in the classroom" (p. 2). This gap in the literature presents a timely opportunity to examine the instructional practices of current P-12 CTE teachers to uncover the signature pedagogies--the most pervasive, instructional strategies implemented by P-12 CTE teachers--within the various disciplines of the field, as well as discover which factors explain instructional strategy use.

Purpose and Research Questions

Accordingly, the purpose of this research study was (a) to identify the potential signature pedagogies within the various disciplines of CTE and (b) to explain instructional strategy use by P-12 teachers' demographic characteristics, course delivery modes, and academic disciplines. To meet these objectives, the following research questions were examined:

1. What are the potential signature pedagogies within the various disciplines of CTE?
2. To what extent do demographic characteristics (i.e., age, gender, race/ethnicity, years of experience, degree attainment, prior teacher preparation), school and course context (i.e., class size, grade level, delivery format, school community), and academic discipline (i.e., agricultural education, business education, family and consumer sciences education) predict instructional strategy use?

Review of Literature

P-12 CTE Teacher Challenges

One of the most important and difficult set of decisions a CTE teacher must make is how to deliver instruction--and make content comprehensible--to their students in challenging and meaningful ways. Currently, teachers are increasingly becoming aware of the need to approach their teaching from a more learner-centered mindset instead of the more traditional teacher- centered model which has dominated instruction in both P-12 and higher education environments for decades (Lammers & Murphy, 2002). Within this new learning paradigm, teachers are encouraged to employ more active learning strategies beyond simply having students listen to lectures and taking notes. Bonwell and Eison (1991) defined active learning strategies as approaches which "involve students in doing things and thinking about the things they are doing" (p.2). In this learner-centered environment, students actively participate in the learning process and contribute to information and knowledge sharing in their courses.

Rehm (2008) found CTE teachers perceived challenges and difficulties--particularly with teaching students with limited English proficiency--with regard to building community and maintaining high standards for their culturally diverse students. They also indicated a number of strategies they implemented as they attempted to build community and increase standards. A number of strategies were identified, including teamwork, pairing students, sharing, laboratory projects, discussions, and applying content to the real world. And, CTE teachers used hands-on practice, demonstrations, and visual aids to work with their limited English proficiency students. Rehm (2008) recommended teacher educators, curriculum specialists, and professional development leaders integrate practical experiences and strategies for addressing cultural and linguistic challenges.

Rayfield et al. (2011) studied how agricultural education—agriscience--high school teachers differentiate their instruction in the classroom. Interestingly, they found lateral entry teachers were significantly more likely to tailor their instructions to meet diverse learning needs compared to traditionally licensed teachers. Additionally, lateral entry teachers were significantly more likely to use critical and creative thinking, differentiated instructional approaches, group students based on learning needs, and use alternative instructional strategies when re-teaching. Rayfield et al. (2011) recommended teacher preparation programs focus on teaching their teacher candidates the principles of differentiated instruction.

Issues in Preparing P-12 CTE Teachers

Based on a national survey of CTE program chairs and teacher educators--regarding their teacher preparation programs--Bruening et al. (2001) examined the status of 227 CTE teacher education programs from 164 higher education institutions. In addition to demographics and course delivery modes, Bruening et al. (2001) identified which instructional approaches were most frequently used. They found 83.2% of programs relied on traditional lectures or labs connected with student teaching internships, 19% used the Professional Development School model. Designing meaningful instructional tasks based on real world problems was identified as the most important critical competency needed by CTE teachers, and the second highest was advancing student learning. Other competencies which rated high included, integrating technology, teamwork skills, staying abreast to changes, and leadership skills. In regard to assessment skills needed, using authentic assessments and adapting programs for special needs' students ranked highest.

Similar to this study, Fletcher, Djajalaksana, and Eison (2012) surveyed 387 CTE faculty--agricultural, business/marketing, engineering/technology, family and consumer sciences, health occupations, trade and industry, workforce education--to determine the most, least, and top three instructional strategies used in the higher education classroom. Findings indicated interactive lecture, questioning, whole-group discussion, and guided practice were the most frequently used approaches. Question and answer methods using clickers, synchronous online lecturing, video creation, student-generated examinations and quizzes, and reflective blogs were the most infrequently used strategies. And, the top three instructional strategies included interactive lecture, questioning, and whole group discussions. The researchers recommended research examining instructional strategies in which P-12 CTE teachers use.

Conceptual Frameworks

Differentiated Instruction

Similar to academic teachers, CTE teachers must attempt to prepare students from all sorts of backgrounds, including individuals who have psychological, social, emotional, and physical disabilities as well as academic or economic disadvantages (Rayfield et al., 2011). Gifted and general education students too need individualized instruction. To meet the needs of such varying learners, CTE teachers need to differentiate their instruction. The concept of differentiated instruction posits that instructional strategies should vary and be adapted based on the individual and diverse needs of students to maximize students' opportunities at success (Hall, Strangman, & Meyer, 2011). According to Hall et al. (2011), "to differentiate instruction is to recognize students' varying background knowledge, readiness, language, preferences in learning and interests; and to react responsively" (p. 3). Further, teachers must engage in informed decision making by selecting appropriate instructional approaches and resources based on lesson objectives and aligned assessment. Therefore, teachers must consider what content to teach, how best to teach it, and how to appropriately and accurately assess student proficiency of the content learned--while also paying close attention to their learners' readiness, interests, and learning preferences (Moon, 2005). However, little attention has been given in the field of CTE in terms of what instructional and assessment strategies teachers use to make the content comprehensible for the purpose of maximizing student learning.

Signature Pedagogies

It is quite likely that disciplines within the field of CTE--i.e., agriculture, business, family and consumer sciences, trade and industry--rely on different instructional approaches to prepare their graduates with the knowledge, skills, and dispositions needed to be successful within their content area. Shulman (2005) explained signature pedagogies are the unique but pervasive ways of teaching within a particular discipline or profession. He described the concept of signature pedagogies as:

> *The types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions. In these signature pedagogies, the novices are instructed in critical aspects of the three fundamental dimensions of professional work--to think, to perform, and to act with integrity. (Shulman, 2005, p.52).*

Shulman (2005) discussed how signature pedagogies are the first pedagogies which come to mind when teachers are asked about the primary instructional approaches which are needed to adequately prepare their students for a particular profession. For example, having a senior physician teach by a patient's bedside while asking a group of interns about the symptoms and potential treatment options are the signature pedagogies in medical school. Shulman (2005) also explained a signature pedagogy should comprise three dimensions: surface structure--strategies which may be viewed at the time when teaching and learning takes place, deep structure--the body of knowledge being taught to prepare individuals in the profession, and implicit structure-- the moral dimensions which express professionalism within a profession.

Within the field of CTE, little is known of which instructional strategies teachers within individual disciplines rely on to make their content comprehensible to students preparing for their profession. We further lack an understanding of what factors contribute to the use of particular instructional approaches. Within that context, we attempted to determine the signature pedagogies within the disciplines of CTE and to uncover the extent to which demographic characteristics, school and course context characteristics, and academic discipline explain instructional strategy use of P-12 CTE teachers.

Methods

Research Design

This study implemented a correlational research design using survey research and applied inferential statistics. Specifically, factor analysis and simultaneous multiple regression analyses were performed to examine the research questions: (a) what are the signature pedagogies used by P-12 CTE teachers; and (b) to what extent do demographic characteristics (i.e., age, gender, race/ethnicity, years of experience, degree attainment, prior teacher preparation), school and course context (i.e., class size, grade level, delivery format, school community), and academic discipline (i.e., agricultural education, business education, family and consumer sciences education) predict instructional strategy use.

Procedures

This study employed nonprobability sampling (Ary, Jacobs, Razavieh, & Sorensen, 2006) specifically utilizing a purposive sampling procedure. Online surveys using Survey Monkey were sent to a sampling frame of 1,066 P-12 CTE teachers from the Association for Career and Technical Education professional association database. Two follow-up emails were sent to non- respondents. A total of 362 respondents completed the survey for a 30% response rate. Cook, Heath, and Thompson (2000) found average response rates for internet-based surveys fell in a range from 25 to 35%. Therefore, it is important to note given the descriptive nature of this study research findings can only be generalized to the 362 respondents in this study.

Participants

Demographics. All participants were currently teaching in a P-12 classroom setting located in the United States. Of the total respondents, 61.9% were female and 35.9% were male. In terms of ethnicities, 84.8% were Caucasian, 8.0% were Black or African American, 2.5% were Multi-racial, 1.7% were Hispanic, 0.6% were American Indian or Alaska Natives, and 0.3% were Native Hawaiian or Other Pacific Islanders. The average age was 50.

Professional Backgrounds. Participants had a range of credentials--in terms of highest degree attained: 0.6% had a high school diploma or GED, 4.4% had an associate's degree, 23.8% had a bachelor's degree, 52.8% had a master's degree, 9.4% had an educational specialist's degree, and 6.9% had a doctorate. The average years of teaching experience was 18.6 years. In regard to current professional positions, 69.9% completed a traditional teacher preparation program, 22.7% completed an alternative licensure program, and 6.4% did not participate in an alternative licensure or teacher preparation program. Participants also taught in a variety of settings: 57.7% taught in a comprehensive school, 23.8% taught in a CTE center, 3.3% indicated "other", 1.4% taught in an alternative school, 0.8% taught in a charter school, and 0.3% taught in a private school. With regard to school community: 42.5% taught in a small urban setting--population of 2,501 to 50,000, 25.4% taught in a rural setting--population of less than 2,500, 22.7% taught in a large urban setting--population 50,001 to 2 million, and 4.7% taught in a metropolitan setting--population greater than 2 million. With respect to disciplines in which the respondents taught, 26.2% taught business and/or marketing education, 21.5% were in family and consumer sciences education, 16.6% were in trade and industrial education, 9.1% were in engineering and/or technology education, 8.3% were in health occupations education, 8.0% were in agricultural education, 8.3% indicated they were in other disciplines.

Courses Taught. Participants taught at various levels: 85.9% taught high school, 12.4% taught middle school, and 0.3% taught elementary. In terms of delivery format, participants taught in the following modes: 92.0 % taught face-to-face, 4.7% taught online, and 2.2% indicated "other." With regard to class size, 18.0% taught classes with 1 to 14 students, 60.5% taught classes with 15 to 29 students, 14.9% taught classes with 30 to 49 students, and 2.2% taught classes with 50 or more students.

Data Analysis

An exploratory factor analysis was executed to examine the dimensions of the subscales for the purpose of validating the instrument. And, a simultaneous multiple regression analysis was performed to assess the significance of the model and the significance of the predictor variables in the model to respond to the research questions of this study. All data were analyzed using SPSS 20.0 software.

Instrumentation

A questionnaire was developed and consisted of 13 demographic and 56 items--with associated descriptions--targeting instructional strategies P-12 CTE teachers employ in their courses. To determine whether items on the questionnaire represented a comprehensive list of instructional strategies as well as captured areas the instrument was designed to measure, content validity was measured (Ary et al., 2006; DeVellis, 2003) by a panel of six expert judges who were P-12 CTE teachers, CTE curriculum specialists, and CTE teacher educators. Based on the expert panel's recommendations, revisions were made to items of the instrument accordingly. Further, construct validity was obtained for the instrument through the execution of exploratory factor analysis. Based on the factor analysis output, six factors emerged: *Writing and Conceptualization Projects*, *Active Learning Assessments, Online Activities*, *Real-World Activities*, *Knowledge Acquisition Activities,* and *Teacher Centered Activities*. With regard to frequency of instructional strategy use, the questionnaire was based on a 56 item six-point summated rating scale (1 = *never*; 2 = *rarely*; 3 = *occasionally*; 4 = *frequently*; 5 = *almost always*; and, 6 = *always*).

Writing and Conceptualization Projects Scale. As a result of factor analysis, nine items emerged which were identified as *Writing and Conceptualization Projects.* These items included the following instructional strategies: concept/mind maps, short papers, original research proposals, literature reviews, minute papers, informal writing, annotated bibliographies, major writing projects, and brainstorming. Reliability was measured by using Cronbach's alpha for the *Writing and Conceptualization Projects* construct which produced a coefficient of 0.85. The generally agreed upon rule for the lower limit of Cronbach's alpha is .70, although it decreases to .60 for exploratory factor analysis (Hair, Black, Babin, Anderson, & Tatham, 2006; Robinson, Shaver, & Wrightman, 1991).

Active Learning Assessments Scale. As a result of factor analysis, 17 items emerged which were identified as *Active Learning Assessments*. These items included the following learning strategies: small group discussions, debates, student presentations, student generated quizzes and exams, think/pair/share, role plays, case studies, lecture not comparison, film/video critiques, student attitude surveys, personal reflection journals, games, student peer assessments, cooperative learning, whole group discussions, video creations, and self-assessments. Cronbach's alpha for the *Active Learning Assessments* construct was 0.88.

Online Activities Scale. As a result of factor analysis, 12 items emerged which were identified as *Online Activities*. These items included the following learning strategies: online formative quizzes, online discussions, online collaborative projects, reflective blogs, synchronous online lectures, asynchronous online lectures, e-portfolios, computer based learning exercises, games and simulations, background knowledge probes, self-directed learning, social networking, podcasts/webcasts/YouTube videos. Cronbach's alpha for the *Online Activities* construct was 0.85.

Real World Applications Scale. As a result of factor analysis, five items emerged which were identified as *Real World Applications*. These items included the following learning strategies: field trips, service learning projects, job shadowing/externships/internships, guest lectures, and school events. Cronbach's alpha for the *Real World Applications* construct was 0.81.

Knowledge Acquisition Activities Scale. As a result of factor analysis, six items emerged which were identified as *Knowledge Acquisition Activities.* These items included the following learning strategies: project based learning, demonstrations, lab activities, student peer teaching, problem based learning, and guided practice. Cronbach's alpha for the *Knowledge Acquisition Activities* construct was 0.76.

Teacher Centered Activities Scale. As a result of factor analysis, five items emerged which were identified as *Knowledge Acquisition Activities.* These items included the following learning strategies: review sessions, quizzes, interactive lectures, lecture, and questioning. Cronbach's alpha for the *Knowledge Acquisition Activities* construct was 0.66.

Findings

Writing and Conceptualization Projects. A simultaneous multiple regression analysis produced a nonsignificant model to explain the implementation of writing and conceptualization projects in courses based on a linear combination of predictor variables (R^2=.11, $F_{(26,\ 340)}$ = 1.46, p>.05, [See Table 1]). The regression model with 26 independent variables accounted for 11% of the variance in the use of writing and conceptualization projects by P-12 CTE teachers. Three independent variables significantly predicted teachers' use of writing and conceptualization projects: P-12 teachers who teach in family and consumer sciences were significantly more likely (b = .34; p<.01) to use writing and conceptualization projects in their courses compared to business and marketing teachers; health occupations teachers were significantly more likely (b = .46; p<.01) to use writing and conceptualization projects in their courses compared to business and marketing teachers; and teachers in career centers were significantly more likely to use writing and conceptualization projects compared to CTE teachers in comprehensive schools (b = .32; p<.01).

Active Learning Assessments. A simultaneous multiple regression analysis produced a significant model to explain the use of active learning assessments in courses based on a linear combination of predictor variables (R^2=.12, $F_{(26,\ 340)}$ = 1.71, p<.05 [See Table 1]). The regression model with 26 independent variables accounted for 12% of the variance in the use of active learning assessments among P-12 CTE teachers. Three independent variables were significantly related to the use of active learning assessments in courses. These variables included the following: family and consumer sciences teachers were significantly more likely (b = 0.28; p<.01) to use active learning assessments compared to business and marketing teachers; teachers who teach in face-to-face courses were significantly more likely (b=.46; p<.05) to use active learning assessments compared to teachers who teach online courses; and teachers in career centers were significantly more likely (b = 0.26; p<.01) to use active learning assessments compared to those in comprehensive schools.

Online Activities. A simultaneous multiple regression analysis produced a significant model to explain the use of online activities based on a linear combination of predictor variables (R^2=.19, $F_{(26,\ 340)}$ = 2.74, p>.001 [See Table 1]). The regression model with 26 independent variables accounted for 19% of the variance in the implementation of online activities in P-12 CTE teachers' courses. Five independent variables were significantly related to the use of online activities in courses: agricultural education teachers were significantly less likely (b = -0.41; p<.05) to integrate online activities within their courses compared to business and marketing teachers; trade and industry teachers were significantly less likely (b = -0.25; p<.05) to integrate online activities compared to business and marketing teachers; health occupations teachers were significantly less likely (b = -0.39; p<.05) to integrate online activities compared to business and marketing teachers; online teachers were significantly more likely (b = 0.51; p<.01) to use online activities compared to face-to face teachers; and teachers in career centers were more likely (b = 0.26; p<.01) compared to teachers who teach in comprehensive schools.

Real World Activities. A simultaneous multiple regression analysis resulted in a significant model to explain the use of real world activities based on a linear combination of predictor variables (R^2=.19, $F_{(26,\ 340)}$ = 2.74, p<.001 [See Table 1]). The regression model with 26 independent variables accounted for 19% of the variance in the use of real world activities in P-12 CTE teachers' courses. Four independent variables were significantly related to use of real world activities in courses: trade and industry teachers were significantly more likely (b = 0.44; p<.05) compared to business and marketing teachers; the higher the degree attained (b = 0.13; p<.05), the more likely he or she would use real world activities; elementary teachers were significantly less likely (b=-2.35; p<.05) compared to high school teachers; teachers in career centers are significantly more likely (b = 0.44; p<.001) to use real world activities in their courses compared to teachers in comprehensive schools.

Knowledge Acquisition Activities. A simultaneous multiple regression analysis resulted in a significant model to explain the use of knowledge acquisition activities based on a linear combination of predictor variables (R^2=.19, $F_{(26, 340)}$ = 2.90, p<.001 [See Table 1]). The regression model with 26 independent variables accounted for 19% of the variance in the use of knowledge acquisition activities. Five independent variables were significantly related to use of knowledge acquisition activities in courses. These variables included: engineering and technology teachers were significantly more likely (b = 0.43; p<.01) to use knowledge acquisition activities in their courses compared to business and marketing teachers; trade and industry teachers were significantly more likely (b = 0.37; p<.05) to use knowledge acquisition activities in their courses compared to business and marketing teachers; native Hawaiian or other Pacific Islanders were significantly more likely (b = 1.63; p<.05) to use knowledge acquisition activities compared to business and marketing teachers; face-to-face teachers were more likely (b=0.48; p<.05) to use knowledge acquisition activities compared to online teachers; teachers in metropolitan areas more significantly more likely (b = 0.60; p<.01) compared to those in rural areas; and teachers who taught in career centers are significantly more likely (b = 0.21; p<.05) to use knowledge acquisition activities in their courses compared to teachers in comprehensive schools.

Teacher-Centered Activities. A simultaneous multiple regression analysis resulted in a significant model to explain the use of teacher-centered activities based on a linear combination of predictor variables (R^2=.13, $F_{(26, 340)}$ = 1.76, p<.01 [See Table 1]). The regression model with 26 independent variables accounted for 13% of the variance in the use of teacher-centered activities by P-12 CTE teachers. Two of the independent variables were significantly related to use of teacher-centered activities. These variables included the following: African American and Black teachers are significantly more likely (b = 0.32; p<.05) to use teacher-centered activities in their courses compared to White teachers; face-to-face teachers are more likely (b = 0.66; p<.01) to use teacher-centered activities compared to online teachers.

Table 1
Variables Predicting Instructional Strategy Use of Writing, Active Learning, and Online Activities

Predictor	Dependent Variables								
	Writing and Conceptualization Projects			Active Learning Assessments			Online Activities		
	b	*SE (b)*	*β*	*b*	*SE (b)*	*β*	*b*	*SE (b)*	*β*
(Constant)	2.05***	.45		2.35***	.38		2.64***	.40	
No Teacher Preparation Program[a]	.20	.20	.06	.32	.17	.12	.28	.18	.09
Alternative Licensure Program[a]	.03	.13	.02	.12	.11	.08	.22	.11	.12
Agricultural Education[b]	.03	.19	.01	-.06	.16	-.02	-.41*	.17	-.16
Family and Consumer Sciences Education[b]	.34**	.13	.18	.28**	.11	.17	-.25*	.11	-.14

Table 1 Continued…

Engineering/Technology Education[b]	.20	.17	.07	.27	.14	.12	.21	.15	.08
Trade and Industrial Education[b]	-.02	.15	-.01	.02	.13	.01	-.34*	.14	-.17
Health Occupation Education[b]	.46**	.18	.16	.19	.15	.08	-.39*	.16	-.15
Years of Experience Teaching	.01	.01	.08	.01	.01	.14	.00	.01	.06
Gender[c]	.03	.12	.02	.12	.10	.09	.08	.11	.05
Age	.00	.01	-.06	-.01	.00	-.11	-.01	.00	-.10
Black or African American[d]	.14	.17	.05	.10	.15	.04	-.12	.15	-.04
American Indian or Alaska Native[d]	.21	.58	.02	.24	.49	.03	.51	.52	.05
Native Hawaiian or Other Pacific Islander[d]	.53	.82	.04	.21	.70	.02	-.07	.73	-.01
Hispanic[d]	.11	.34	.02	.18	.29	.03	.59	.30	.11
Highest Degree Attained	.01	.05	.01	-.02	.04	-.03	.01	.05	.01
Course Level Elementary[e]	-1.52	.87	-.10	-.83	.74	-.07	-.72	.77	-.05
Course Level Middle School[e]	.19	.14	.08	.10	.12	.05	.17	.13	.08
Delivery Face-to-Face[f]	.17	.25	.04	.46*	.21	.12	-.51*	.22	-.13
Class Size	.04	.07	.04	-.01	.06	-.01	.05	.06	.05
Small Urban Community[g]	-.02	.11	-.02	.02	.09	.02	-.08	.10	-.05
Large Urban Community[g]	.01	.13	.00	.05	.11	.03	.05	.11	.03
Metropolitan Community[g]	.32	.24	.09	.29	.20	.09	.04	.21	.01
Alternative School[h]	-.54	.41	-.07	-.16	.35	-.03	.44	.37	.06
Charter School[h]	-.79	.49	-.09	-.59	.42	-.08	-.49	.44	-.06
Private School[h]	-.23	.80	-.02	-.36	.68	-.03	-.56	.71	-.04
Vocational/Technical (Career) School[h]	.32**	.11	.17	.26**	.09	.16	.26**	.10	.15
R^2	.11			.12			.19		
F	1.46			1.71*			2.74***		

Note. ***n*=340. * *p*<.05, ***p*<.01, ****p*<.001**

[a]No Teacher Preparation and Alternative Licensure Program are dummy variables created for Teacher Preparation Program, in reference to the the response Yes in Teacher Preparation program. The Yes in Teacher Preparation program was coded 0 and the No in Teacher Preparation Program and the No, but taking Alternative Licensure Program were coded 1 accordingly.

[b]The Discipline variable responses were dummy coded in reference to the Business and Marketing Education. The Business and Marketing Education was coded 0, and when selected, each discipline was coded 1.

[c]Gender was coded 0 for male and 1 for female

[d]The Ethnicity variable responses were dummy coded in reference to the White or Caucasian. The White or Caucasian was coded 0, and when selected, each ethnicity was coded 1.

[e]Course level variable responses were dummy coded in reference to High School level. The High School was coded 0, and when selected, each level was coded 1.

[f]Delivery variable responses were dummy coded in reference to Online delivery. The online delivery was coded 0, and the Face-to-Face delivery was coded 1.

[g]Community variable responses were dummy coded in reference to the Rural Community. Rural community was coded 0, and when selected, each community was coded 1.

[h]The choices of type of school were dummy coded in reference to Comprehensive school. The Comprehensive school was coded 0, and when selected, each school type was coded 1.

Table 2
Variables Predicting Instructional Strategy Use of Real World, Knowledge Acquisition, and Teacher Centered Activities

Predictor	Dependent Variables								
	Real World Activities			Knowledge Acquisition Activities			Teacher Centered Activities		
	b	*SE (b)*	*β*	*b*	*SE (b)*	*β*	*b*	*SE (b)*	*β*
(Constant)	1.41**	.53		3.10***	.43		3.05***	.39	
No Teacher Preparation Program[a]	.15	.23	.04	.04	.19	.01	.18	.17	.07
Alternative Licensure Program[a]	.20	.15	.08	.08	.12	.04	.14	.11	.08
Agricultural Education[b]	.39	.22	.11	-.27	.18	-.10	-.02	.16	-.01
Family and Consumer Sciences Education[b]	.20	.15	.08	-.05	.12	-.03	-.14	.11	-.09
Engineering/Technology Education[b]	.03	.20	.01	.43**	.16	.16	-.15	.15	-.06
Trade and Industrial Education[b]	.40*	.18	.15	.37*	.15	.18	.02	.13	.01
Health Occupation Education[b]	.24	.21	.07	-.19	.17	-.07	.13	.15	.05
Years of Experience Teaching	.01	.01	.07	.00	.01	.06	.00	.01	.05
Gender[c]	.21	.14	.10	.07	.11	.04	.01	.10	.01
Age	.01	.01	.06	.00	.01	.05	.00	.00	-.01
Black or African American[d]	.22	.20	.06	.12	.16	.04	.32*	.15	.12
American Indian or Alaska Native[d]	.75	.68	.06	-.46	.55	-.04	.03	.50	.00
Native Hawaiian or Other Pacific Islander[d]	-.30	.97	-.02	1.63*	.78	.11	.18	.71	.01
Hispanic[d]	.46	.40	.06	.16	.32	.03	.44	.29	.08
Highest Degree Attained	.13*	.06	.12	-.02	.05	-.02	-.06	.05	-.07
Course Level Elementary[e]	-2.35*	1.02	-.13	.97	.82	.07	-.78	.75	-.06
Course Level Middle School[e]	-.28	.16	-.09	.21	.13	.09	-.08	.12	-.04
Delivery Face-to-Face[f]	.09	.30	.02	.48*	.24	.11	.66**	.22	.18
Class Size	-.10	.08	-.07	.01	.07	.01	.07	.06	.07
Small Urban Community[g]	.13	.13	.06	.15	.10	.10	.04	.09	.03
Large Urban Community[g]	.14	.15	.06	.21	.12	.11	.00	.11	.00
Metropolitan Community[g]	.53	.28	.12	.60**	.22	.17	-.05	.21	-.02
Alternative School[h]	-.20	.49	-.02	-.12	.39	-.02	-.36	.36	-.06
Charter School[h]	-.96	.58	-.09	-.67	.47	-.08	-.47	.43	-.06
Private School[h]	-.39	.95	-.02	-.53	.76	-.04	-.57	.69	-.04
Vocational/Technical (Career) School[h]	.46***	.13	.20	.21*	.10	.12	.14	.09	.09
R^2	.19			.19			.13		
F	2.74***			2.90***			1.76*		

Note. *n*=340. * *p*<.05, ***p*<.01, ****p*<.001

Table 2 Continued…

[a]No Teacher Preparation and Alternative Licensure Program are dummy variables created for Teacher Preparation Program, in reference to the the response Yes in Teacher Preparation program. The Yes in Teacher Preparation program was coded 0 and the No in Teacher Preparation Program and the No, but taking Alternative Licensure Program were coded 1 accordingly.
[b]The Discipline variable responses were dummy coded in reference to the Business and Marketing Education. The Business and Marketing Education was coded 0, and when selected, each discipline was coded 1.
[c]Gender was coded 0 for male and 1 for female
[d]The Ethnicity variable responses were dummy coded in reference to the White or Caucasian. The White or Caucasian was coded 0, and when selected, each ethnicity was coded 1.
[e]Course level variable responses were dummy coded in reference to High School level. The High School was coded 0, and when selected, each level was coded 1.
[f]Delivery variable responses were dummy coded in reference to Online delivery. The online delivery was coded 0, and the Face-to-Face delivery was coded 1.
[g]Community variable responses were dummy coded in reference to the Rural Community. Rural community was coded 0, and when selected, each community was coded 1.
[h]The choices of type of school were dummy coded in reference to Comprehensive school. The Comprehensive school was coded 0, and when selected, each school type was coded 1.

Discussion

Business and marketing education teachers were significantly less likely to use writing and conceptualization projects--concept/mind maps, short papers, original research proposals, literature reviews, minute papers, informal writing, annotated bibliographies, major writing projects, and brainstorming-- in comparison to family and consumer sciences education as well as health occupations teachers. This finding is unexpected and quite concerning given the need for business and marketing students to communicate effectively in both verbal and written forms. As such, it is important for teacher educators, as well as school administrators, to provide professional development for business and marketing teacher candidates and practicing teachers. Business and marketing education teachers need to understand not only the importance of teaching their students writing skills but also need examples of how they can integrate this into their teaching.

Business and marketing education teachers were significantly less likely to use active learning assessments – small group discussions, debates, student presentations, think/pair/share, role plays, case studies, cooperative learning, whole group discussions-- in comparison to family and consumer sciences education as well as engineering and technology education teachers. This finding is unexpected and quite concerning as well given the need for business and marketing teachers to prepare their students for the 21st Century workforce which requires group cooperation, interaction, innovation and the development of critical thinking and problem solving skills (Partnership for 21st Century Skills, 2010).

It was, however, not surprising to find business and marketing education teachers were significantly more likely to use online activities--online quizzes, discussions, collaborative projects, blogs, asynchronous and synchronous lectures, portfolios, exercises, games and simulations, social networking, podcasts/webcasts/YouTube videos--compared to agricultural, trade and industry, and health occupations education teachers. Similarly, Kotrlik and Redmann (2004) found business and marketing education teachers were stronger than agriscience teachers in the exploration, adoption, and integration of technology in their courses. Additionally, Kotrlik and Redmann (2009) found business education teachers were more likely to have a teacher computer with Internet at school and computer lab for students. The finding that business and marketing ducation teachers are using online activities is expected given the nature of the discipline and the charge for many business teachers to prepare students to use computer applications as well as computer programming for business as well as in postsecondary education.

However, trade and industry teachers were significantly more likely to use real world activities--field trips, service learning projects, job shadowing/externships/internships, guest lectures, and school events--compared to business and marketing education teachers. This could be related to the connection trade and industry teachers might have with business and industry. For example, cosmetology and HVAC teachers are more likely to have frequent visits to local businesses as well as bring practitioners into their classrooms more often than business and marketing education teachers, particularly because trade and industry fields tend to be more specialized and focused on a certain industry compared to the exposure of a more broad array of careers within business and marketing.

Engineering and technology education and trade and industry teachers were significantly more likely to use knowledge acquisition activities--project based learning, demonstrations, lab activities, peer teaching, problem-based learning, and guided practice--in comparison to business and marketing education teachers. This finding might be attributed to the nature of the engineering and technology as well as trade and industry fields as they essentially focus on applied, hands-on-learning as well as laboratory work in comparison to business and marketing areas. Students in engineering and technology as well as trade and industry are oftentimes required to consume a large amount of highly technical material and will need to apply that knowledge through various learning strategies--such as demonstrations--to show they comprehend the content and are able to transfer it to a real world project. With that stated, business and marketing education teachers can still use knowledge acquisition activities to check for student understanding of content and to ensure they are able to transfer their learning within a real world setting.

In terms of school context, teachers teaching within career centers were significantly more likely to use writing and conceptualization projects, active learning assessments, online activities, real world activities, and knowledge acquisition activities in comparison to those teachers who teach in comprehensive schools. These findings point to the beneficial nature of students learning in career centers and indicate these teachers are engaging students in relevant and meaningful ways. Career centers typically provide students with real world settings and co-curricular student organizations. Stated differently, students in career centers benefit from a workplace-like setting in which learners typically wear appropriate attire consistent with their work environment. For example, culinary arts students wear chef hats and clothing simulating a real working environment. Prior research using case studies has pointed to separate vocational schools as providing better quality programs for students compared to comprehensive schools primarily due to the greater depth of programming, having more experienced teachers, the priority they afford to vocational training, and their partnerships with business and industry (Weinsberg, 1983). Career centers typically have equipment needed to simulate the actual workplace setting. For example, auto mechanic programs work on actual cars in garages which simulate their work environment. Additionally, career center teachers oftentimes have strong advisory boards with community members, as well as individuals from business and industry, to offer guidance on the curriculum and to transform instruction to better reflect the demands of their fields. Forming partnerships with business and industry assists their students in gaining real world experiences through activities such as field trips, job shadowing, and work based learning. Based on the findings of this study, teachers teaching within career centers also rely on a variety of instructional approaches to maximize student learning. Thus, career centers might be a more promising schooling environment for students compared to comprehensive schools. On the other hand, comprehensive schools tend to deemphasize CTE course offerings and course taking and focus primarily on academic courses--particularly for White students (Oakes, Selvin, Karoly, & Guiton, 1992). Oakes et al. (1992) explained this situation within the context of comprehensive schools:

> *At best the current context for high school vocational education is characterized by benign neglect of its programs and students and at worst by disdain for programs, teachers, and*

students. In either case, vocational programs are unlikely to receive school-level support or resources for program or staff development or to be perceived as offering exciting curriculum challenges to any but the least motivated and least skilled students. At the same time, these programs are likely to be the first casualties of resource constraints or changes in curriculum polices, and, with the possible exception of business courses, they are often perceived as appropriate only for students with serious academic or behavioral problems. (xi)

It was surprising to find teachers' preparation--or lack thereof--for the field of teaching, did not significantly impact their instructional strategy use. This was unexpected given findings of a prior agricultural education study which found significant differences between alternatively and traditionally licensed teachers: with alternatively licensed teachers using critical and creative thinking strategies in their courses as well as whole group instruction (Rayfield, Croom, Stair, & Murray, 2011). On the other hand, traditionally licensed teachers were more likely to use small group instruction in Rayfield et al.'s (2011) study. This finding certainly raises the question of whether teacher preparation influences the pedagogical approaches to which their teacher candidates implement in their future practice.

Implications for Future Research

It is important to note limitations to this study. First, this study did not use a random sample of P-12 CTE teachers. Therefore, the findings of this study can only be generalized for the 340 P-12 CTE teachers who chose to participate. While this study was an initial attempt to identify potential signature pedagogies in the field of CTE, to be viewed as signature pedagogies (Shulman, 2005), it must include the following dimensions: (a) surface structure: the operational conduct in teaching and learning which can be viewed concretely; (b) deep structure: assumptions on how to transfer knowledge and practices of the field; and (c) implicit structure: moral aspects which include attitudes, values, and characters of the field. Thus, the present study should be viewed as exploratory in that it only identified which instructional strategies P-12 CTE teachers purport to use in their classrooms as well as assessed which demographic characteristics, school and course context, and academic disciplines predict instructional strategy use. Subsequent research will need to systematically explore the underlying deep and implicit structures of teaching CTE courses. This would then assist teachers in understanding why certain signature pedagogies are used in respective disciplines as well as how this relates to critical competencies of students in each discipline.

Further, qualitative research utilizing interviews and observations with selective P-12 CTE teachers are needed to study exemplary practices within the CTE disciplines. The selection of participants for such continuing studies can come from CTE teachers who might have been recognized and won teaching awards. Potential interview questions to investigate deep and implicit structures of their preferred pedagogies may include items exploring their fundamental assumptions of: (a) what constitutes teaching excellence within the CTE field; (b) why do teachers prefer to use specific instructional strategies for teaching their courses; (c) what instructional practices and strategies will maximize students' learning of essential CTE dispositions, knowledge, and skills; (d) what soft skills and ethical practices are most needed by CTE professionals in each discipline; and (e) how these soft skills and ethical practices can best be taught to CTE students.

Moreover, we need to better understand the pedagogical approaches and practices of teachers who teach in career centers compared to those who teach in comprehensive schools. Observations, an examination of curriculum documents, interviews with administrators, curriculum specialists, teachers, guidance counselors, students, and parents would be especially useful to compare the teaching practices between career centers and comprehensive schools.

Implications for Practice

Teacher educators should attempt to utilize differentiated instructional strategies within their classrooms and make explicit their use as models of what P-12 CTE teacher candidates can implement within their future classrooms. Additionally, administrators and curriculum specialists should offer professional development opportunities for their teachers to demonstrate how alternative pedagogical approaches may be utilized in the classroom, particularly those strategies which will help our students prepare for the 21st Century workforce. For example, business and marketing education teachers should learn the importance, as well as how to integrate more writing and conceptualization projects, as well as active learning assessments, into their courses.

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MEASURING THE NUMBER OF OUT-OF-FIELD TEACHERS IN BUSINESS EDUCATION

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Introduction

Educators have always known about the practice of out-of-field teaching, but a lack of accurate statistics on the practice has kept it largely unrecognized and one of education's "dirty little secrets." This situation was changed with the release of the Schools and Staffing Survey, a survey of the nation's elementary and secondary teachers conducted by the National Center for Education Statistics of the U.S. Department of Education (Ingersoll, 1998).While there have been studies to determine the extent of out-of-field teaching in some subject areas, there are currently no studies on the extent of out-of-field teaching in CTE.

Measuring Out-of-Field Teaching

Empirical examination of out-of-field teaching is a multifaceted process. There are a large number of different ways of defining and measuring out-of-field teaching, and there are several methods of measuring "qualified" teachers. According to Ingersoll (2002), measures of out-of-field teaching differ according to whether the focus is on the number of teachers assigned to teach content out of their field, on the number of classes taught by out-of-field teachers, or on the number of students taught by out-of-field teachers. How one chooses to define and measure out-of-field teaching makes a difference in the study of out-of-field teaching.

The Schools and Staffing Survey (SASS) collects extensive information on both the daily course assignments and the educational background from a large nationally representative sample of teachers. The numbers and types of certification teachers hold and the major and minor fields of study for degrees earned at both the undergraduate and graduate levels is reported by the teachers. Each teacher surveyed reports the subject taught, grade level, and number of students enrolled for each of the classes they teach every day (U.S. Department of Education, n.d.). Research on out-of-field teaching measures how many teachers in a particular field meet a particular standard of qualification, or combination of qualification, in a particular field. There is, however, a lack of consensus on what deems a teacher "qualified." There is definite controversy on how much education, what types of training, and which kinds of preparation and credentials teachers need in order to be considered "qualified." As a result, there are many ways of defining and assessing the extent of out-of-field teaching.

Ingersoll (2002) identified five possible standards for deeming a teacher "qualified." The first method is to screen teachers' scores in field-specific examinations. The second method of assessing teachers' educational qualifications is to count the actual number of postsecondary courses teachers have completed in their content area. The third method examines whether teachers in each field hold a license or teaching certificate in that field. The fourth method is to identify if the teachers have earned an undergraduate or graduate major or minor in the content area. The fifth method measures whether teachers in each content area have both a full major and a full teaching certificate. Each of these methods has its advantages and disadvantages. Many previous studies of out-of-field teaching have been conducted using the fourth method--undergraduate or graduate major or minor in content area. However, the focus of this measure is on the actual majors and minors teachers have completed in the field, regardless of whether the teacher has applied for and obtained a teaching certificate in their content area in the state or not. The advantage to this measure is that it is a good indicator of the number of teachers in any given field who lack a minimal level of educational prerequisites in that field. In most cases, the major or primary field of concentration required by a bachelor's and master's degree entails successful completion of at least 10 courses in the content area. A minor, certificate, or concentration require as few as 4 or 5 courses in the content area. While this measure indicates how many teachers are or are not minimally qualified, it does not tell us how many are fully qualified. The fifth measure, major and certification in content area, tells us how many teachers are fully qualified. Fully qualified teachers are often identified by policy groups as those possessing both a full major and a full teaching certificate in the content area. Regardless of which definition of a "qualified" teacher one chooses, it should be known that the definition makes a difference for the amount of out-of-field teaching one finds.

Out of Field--Out of Touch

A need for research on out-of-field teaching is the concern that out-of-field teachers harm academic achievement. The research in the areas of out-of-field teaching and how it affects student achievement is limited. In addition the focus of the studies has been core content areas, not CTE. The results of these studies on core academic content areas report that while out-of-field teaching is particularly acute in mathematics and in high-poverty and high-minority schools, the problem is pervasive. Nationwide, more than 17 percent of all core academic courses (English, math, social studies, and science) in grades 7-12 are taught by an out-of-field teacher. In the middle grades alone, the rate jumps to 40 percent. The No Child Left Behind (NCLB) Act requires that states ensure that poor and minority children are not taught at higher rates than other children by inexperienced, unqualified, or out-of-field teachers. Although the NCLB law and State Education Agencies (SEAs) currently offer very clear definitions of "highly-qualified" teachers, "teacher quality" remains a contested term-particularly at local levels (Choi, 2010).

The Convenience Factor

There is no denying the fact that a significant number of out-of-field teaching assignments in our nation's secondary schools is a major source of concern, especially in high-poverty schools. However, it is naive and irresponsible to suggest that the major reason for the out-of-field assignment of teachers is principals assigning teachers without a concern for either the teachers or the students. The realities of teacher recruitment, selection, and placement compel principals to make difficult decisions. Deteriorating facilities, decreasing salaries, safety issues, overcrowded classrooms, budgetary challenges, legislative mandates, and policy directives limit a principal's ability to retain fully certified teachers. When principals make out-of-field assignments, they accept the reality that they will more likely be inviting chaos. It defies logic to suggest that principals do not want fully credentialed teachers in every classroom, especially in a climate of rigorous academic standards and high-stakes testing (Terozzi, 2002).

On the other hand, many principals find that assigning teachers to teach out of their fields of expertise is often not only legal but also more convenient, less expensive, or less time-consuming than the alternatives. For example, rather than find and hire a teacher to teach a new class, a principal may find it less expensive to assign an already employed teacher to teach it, even if they have little background in the content area. When faced with the choice between hiring a fully qualified candidate for a vacant position or hiring a less qualified candidate who is also willing to coach a major varsity sport, a principal may find it more convenient to hire a less qualified candidate. If a teacher suddenly leaves in the middle of a semester, a principal may find it faster and cheaper to hire a readily available, but not fully qualified, substitute teacher, rather than conduct a formal search for a new teacher (Ingersoll, 1998).

Out-of-Field Teaching Data in CTE and Business Education

The researcher has applied for a license to obtain data from the 2011-2012 Schools and Staffing Survey (SASS) from the National Center for Education Statistics. There are no public-use data files for the 2003-04 SASS, the 2007-08 SASS, or the 2011-12 SASS, but data from the 1999-2000 Schools and Staffing Survey is available through the NCES Web site. The Institute for Education Sciences (IES) uses Restricted-data Licenses as a mechanism for making more detailed data available to qualified researchers. The IES Web site does provide a copy of the survey used for the 2011-2012 SASSA. The 2011-2012 survey identified CTE courses as: agriculture and natural resources, business management, business support, marketing and distribution, healthcare occupations, construction trades, engineering or science technologies (including CADD and drafting), mechanics and repair, manufacturing or precision production (electronics, metalwork, textiles, etc.), communications and related technologies (including design, graphics, or printing; not including computer science), personal and public services (including culinary arts, cosmetology, child care, social work, protective services, custodial services, and interior design), family and consumer sciences education, industrial arts or technology education, other career or technical education (U.S. Department of Education, n.d.). Once the current data is received, the results will be reported for CTE and also for business education (business management, business support, marketing and distribution). The researcher will measure out-of-field teaching in both CTE and business education using the fifth method identified by Ingersoll and stated in the section above, which is “teacher possesses both a full major and a full teaching certificate in CTE.” The researcher will report the data based on the number of teachers assigned to teach content out of their field.

Conclusion

There is a definite need to conduct research on the extent of out-of-field teaching in CTE. Although CTE courses are not considered core courses, there has been significant emphasis on CTE as a result of the adoption of Common Core State Standards (CCSS). The goal of the CCSS is to graduate all students ready for college, careers, and life. In order for our educational system to achieve these lofty goals, we must ensure that qualified teachers are being place in all courses. We must find ways to ensure that the new standards rigorously engage all students in all courses. The first step in achieving this goal is to assess the current level of out-of-field teaching in CTE courses.

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