

EFFECTS OF THE QUALITY OF INSTRUCTIONAL OBJECTIVES ON
SELF-REGULATION AND COURSE PERFORMANCE OF
STUDENTS IN UNDERGRADUATE ONLINE AND
NON-ONLINE CLASSES

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ABSTRACT

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Many studies have investigated web-based learning in higher education and the effects it has on academic performance including self-regulation (Janicki & Liegle, 2001; MacDonald, Stodel, Farres, Breithaupt, & Gabriel, 2001; McKeachie, 1999). While many theoretical and operational definitions exist on self-regulation, researchers agree that it includes metacognitive, motivational, and behavioral factors of one's learning process (Zimmerman, 1990). Metacognitive self-regulation refers to an individual who "plans, sets goals, organizes, self-monitors, and self-evaluates at various points during the process of acquisition" (Zimmerman, 1990, pp. 4-5). While some studies have examined the relationship between academic self-regulation and web-based learning in higher education, researchers believe that the relationship requires further investigation (e.g., Hodges, 2005; Whipp & Chiarelli, 2004). One element of the relationship that Hodges identifies as requiring further study is guided self-regulation for students in web-based courses. He states that "research indicates that building self-regulatory scaffolding into web-based course or simply providing instruction on self-regulation can be

effective components of a course” (p. 381). Given Hodges’ emphasis on self-regulatory guidance, also supported by Pintrich (1999) and Ley and Young (2001), the author believes that well-written instructional course objectives can provide students in web-based courses with self-regulatory guidance. To date, online searches with several key terms related to syllabus(or syllab*), instructional objectives, and self-regulation in any medium (e.g., face-to-face or online course) using PsycARTICLES, PsychINFO, ERIC, and Google Scholar have not yielded any relevant results. While no studies seem to exist in this area, McKeachie (1999) and Ford (2002) discuss the elements of a good syllabus (e.g., course goals) related to the positive effects on academic performance, which include clear instructional objectives. Therefore, the purpose of this study is to examine the relationship between instructional objectives as it affects academic self-regulation and academic performance among undergraduate students enrolled in a web-based class and a non-web-based class.

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CHAPTER 1

INTRODUCTION

With the increased attention given to measurable standards across all levels of education, improving academic performance of students is becoming increasingly important in higher education (Dill & Soo, 2005; Wenglinksy, 2002). To measure students' academic performance in an undergraduate course, traditional measures such as tests, quizzes, written papers, presentations, class participation, and more recently performance based (authentic and simulated) measures, problem-based learning and portfolios are used (McKeachie, 1999). To account for a final course measure of students' academic performance, these measures are often averaged to yield a letter grade, which is equivalent to point(s) (e.g., GPA).

While there are many other traditional and more current innovative ways to measure students' academic performance, their performance on a number of these measures has been shown to be affected by student and teacher characteristics (e.g., age gender and ethnicity) and social and environmental factors (e.g., classroom, peer and family influences, and urban, rural and suburban areas) (Hijazi & Naqvi, 2006; McKeachie, 1999). Student and teacher characteristics affecting academic performance include personality (Chamorro-Premuzic & Furnham, 2003; Keup, 2006; Lowe & Cook, 2003), learning styles (Stice, 1987) and intelligence (Keup, 2006). Examples of social and environmental factors may include peer influences (Zimmerman, 2003), socio-economic factors (Van-Laar, Sidanius, Rabinowitz, & Sinclair, 1999), and course design. Of the factors that contribute to increased academic performance, student self-regulation and environmental curriculum design-instructional objectives will be the focus of this

study. As well, course deliver methods (online, blended, or classroom) are discussed as an environmental factor.

The first factor affecting academic performance to be investigated in this dissertation is self-regulation. Self-regulation refers to the ability of individuals to personally set goals, devise plans to accomplish goals, monitor goals, evaluate goals, and adjust their performance to better accomplish the goals. Many undergraduate students successfully self-regulate with the purpose of achieving the highest course grade. In fact, research has demonstrated that students who successfully self-regulate have increased academic performance (Lindner & Harris, 1992; Zimmerman, 1990; Zimmerman & Martinez- Pons, 1986a, 1986b).

The next factor affecting academic performance is curriculum design, in particular, instructional objectives in higher education (Tyler, 1971). Scholars have named and defined instructional objectives differently; however, instructional objectives can be best described as the intended learning outcomes instructors want their students to accomplish for the course. A few studies have examined the relationship between instructional course objectives and academic performance in higher education. One such study has showed that course objectives increased student academic performance in higher education (Stecker, Fuchs, & Fuchs, 2005).

The final factor affecting academic performance is course delivery: online, blended, or classroom (face-to-face). Given the increased demand of online higher education course delivery, it is no surprise that educators have investigated many factors contributing to academic success in online learning. Many of the factors affecting academic success in online courses are similar to face-to-face or traditional classroom

settings. For instance, online students can be evaluated similarly to face-to-face students when instructors use exams and papers as their assessments. Other factors contributing to academic success are environment, social interaction and group dynamics, instructional style, course design, choice of activities, and student and instructional characteristics.

While there are a few studies that have examined the relationship between self-regulation, instructional objectives, and course delivery separately and their effects on academic performance, at the present no studies exist that explicitly examined the relationship between the quality of instructional objectives, self-regulation, and learning environment (online versus face-to-face class delivery) on academic performance among undergraduate students. Researchers suggest that these variables be further researched to assess their impact on academic performance, particularly in an online learning setting (Tallent-Runnels et al., 2006). It is believed that examining this relationship can inform higher educational institutions in determining whether instructional objectives need to be well-written to increase self-regulation in an online or non-online environment to achieve higher academic performance among their undergraduate students.

Research Question and Hypothesis

The following questions were addressed in this study.

Primary Research Question: Does the quality of instructional objectives affect self-regulation and academic performance more in an online course than a face-to-face (traditional) course among undergraduate students?

Secondary Research Question: Is there a relationship between the quality of instructional objectives, comfort and familiarity with computers, Internet, and Blackboard, and frequency of Blackboard, self-regulation, academic performance among

undergraduate students? And how is this relationship affected by course delivery and quality of instructional objectives?

CHAPTER 2

LITERATURE REVIEW

Self-regulation

Theories

A number of theories and models on self-regulation began in the 1980's to describe the learning process of individuals (Whipp & Chiarelli, 2004), almost all of these theories began with Bandura's (1986) cognitive-behavioral theory. Most experts agree that self-regulation has metacognitive, motivational, and cognitive components necessary for self-regulation (Butler & Winne, 1995; Lindner & Harris, 1992; Perry, Phillips, & Hutchinson, 2006; Pintrich, 1999; Zimmerman, 1990). There are many theories and research on self-regulation which are best defined, described and summarized by Bandura (1986), Zimmerman (1998, 1990), and Winne (Butler & Winne, 1995; Winne & Hadwin, 1998). Self-regulation occurs when individuals can observe, set, plan, and execute goals, assess and judge their performance by some evaluative standard, and ultimately decide to adjust or change their performance. When describing self-regulation in academic contexts, self-regulation refers to a person's ability to be a successful learner which can be measured by a course outcome in higher education (e.g., letter grade). A further definition of academic self-regulation is described by Key and Young (2001) as "an effort put forth by students to deepen, monitor, manipulate, and improve their own learning" (p. 93). In the next few paragraphs, an overview of Bandura, Zimmerman, and Winne's definitions and models of self-regulation will be presented.

Bandura. In defining self-regulation, Bandura (1986) discusses several mechanisms and processes that contribute to a model of self-regulation. The processes contributing to self-regulation are named “self-observation”, “judgmental”, and “reactive”. In the “self-observation” process individuals monitor their own behaviors, which may be influenced by values, mood, and competing events and thoughts. “Self-observation” allows individuals to evaluate their own behavior which can lead to change. In fact, he states “if they want to exert influence over their actions, they have to know what they are doing. Success in self-regulation, therefore, depends partly on the fidelity, consistency, and temporal proximity of self-monitoring” (pp. 336-337). The experience of “self-observation” allows individuals to set realistic performance standards (self-diagnoses) and influences individuals to be self-motivated to monitor their goal(s).

The second process, “judgmental function”, allows individuals to positively or negatively evaluate themselves given the personal standard(s) that has been set. These standards are influenced by number of factors affecting the “judgmental function” process, such as other standards imposed internally and externally (e.g., family standards). As a result, this “judgmental function” (self-judging) process creates fluctuations of personal standards due to the individual’s internal and external influences and experience of the learning task. For instance, a student may have a standard of “knowing 80% of the material on the final exam to pass the course.” This student may consider the externally standards that influence their personal standards such as suggestions posed by their academic advisor or parents’ to obtain all “As” on their exams. As a result, the student may consider 80% on an exam or a 3.00 GPA as a sufficient personal standard, but wants to please his/her parents, and consequently will be

motivated to perform above his/her personal standard. Hence, the student's internal and external influences can change the initial personal standard thereby causing the standard to fluctuate.

The third process is "self-reactive influences" which develops after the "self-monitor" and "judgment" process has occurred. "Self-reactive influences" are the actions an individual takes to accomplish the performance standard given the first two processes of self-regulation. It is influenced by the evaluation of internal/personal standards an individual creates, in addition to motivating factors (e.g., incentives and punishments). Bandura states the issue in this process is selecting a standard that is judged as adequate and does not maintain a certain behavior. For instance, a student wishing to achieve a passing score in the class by memorizing 80% of the course material will need to create actions to accomplish this. To do this, the student may use study strategies such as re-reading, organizing materials, and using cue cards.

Overall, Bandura states that effective self-regulators track their behavior, set goals, use a number of strategies rather than a single technique, and create incentives for themselves. In addition, they are better at being persistent and produce better results.

Zimmerman. Zimmerman (1990) believes that learners who self-regulate successfully are self-aware of their knowledge base (i.e., what they know and don't know). He believes that successful self-regulators are those who are self-motivated and seek resources when they do not know a fact or answer. From his observations of the self-regulation literature, he has concluded that self-regulation theorists believe in two major self-regulation processes, which are learning and motivation. These two processes interact and depend on each other. In addition to these two self-regulation processes,

Zimmerman believes that self-regulators display features of the “self-oriented feedback loop” and a rationale for selecting a particular strategy. In addition, he describes categories and phases of self-regulation, described below.

The self-regulation processes of learning and motivation include “metacognitive”, “motivational”, and “behavioral” subprocesses. The “metacognitive” subprocess refers to a learner who “plans, sets goals, self-monitors, and self-evaluates at various points” (p. 5). As a result, the learners are able to become more aware, increase their knowledge, and are more decisive. The “motivational” subprocess refers to a learner who is intrinsically motivated, attributes their accomplishments and failings to themselves, and is highly self-efficacious. Finally, the “behavioral” subprocess refers to a learner who creates an environment where he/she “selects, creates, and structures” their learning. In other words, learners seek out advice and information, self-reinforce their “learnings”, and self-instruct.

Individuals displaying the characteristics of successful self-regulation in the above subprocesses also display additional characteristics, according to Zimmerman (1990). One such characteristic is the ability to build a “self-oriented feedback” loop. The continuous feedback loop is a cyclic process that allows students to observe and assess their learning and change their approach to learning (e.g., read a text by underlining key words). The other characteristic is the selection of a certain strategy or response when learning. For instance, operant theorists believe that individuals choose a certain strategy or response because of the acquisition of rewards while phenomenological theorists believe that individuals are motivated by self-esteem or self-actualization.

Zimmerman and Martinez-Pons (1988) described categories of self-regulated learning strategies which were highly correlated with academic achievement on standardized tests. They include self-evaluation, organizing and transforming, goal setting and planning, seeking information, keeping records and self-monitoring, environmentally structuring, self-consequences, rehearsing and memorizing, seeking peer, teacher, or adult assistance, and reviewing notes, tests or textbooks. While these categories affect academic achievement, the authors acknowledge that the learners' environment (social) and motivation will also affect the learners' academic achievement.

Not only does Zimmerman describe the self-regulation processes and categories, Zimmerman describes three phases of self-regulation. They include "forethought", "performance", and "self-regulation" with two processes occurring in each phase (Zimmerman, 1998; Zimmerman & Tsikalas, 2005). "Forethought" begins when a learning task is presented to the student. During "forethought", two processes occur, specifically task analysis and motivational beliefs. These processes are essentially goal setting and strategic planning. The "performance" phase includes two processes which are self-control and self-observation. The self-control process refers to students focusing on and managing distractions. The self-observation phase refers to a learner who self-instructs and self-observes (cognitively and affectively). Finally, the third self-regulation phase includes two processes, which are self-judgments and self-reactions. Self-judgments occur when students monitor and evaluate their performance. Successful self-regulators self-judge by attributing appropriately. In the self-reactive phase they are reacting to how they performed in their learning.

Winne. Similar to Banudra and Zimmerman, Winne's (Butler & Winne, 1995; Winne & Hadwin, 1998) model of self-regulation emphasizes the use of metacognition. In his model they describe four stages, which include "defining the task", "planning and goal setting", "enacting tactics", and "adapting meta-cognition". In the first stage, the individual is defining the task relative to the task and cognitive conditions. Task conditions refer to external factors such as instructional cues and resources available to the learner such as instructional course objectives. Cognitive conditions include personal beliefs such as self-efficacy, motivation, and knowledge of the task. The second stage is planning and goal setting. The third stage refers to selecting strategies such as information management and seeking help. Finally, the fourth stage occurs when individuals evaluate their own performance referred to as meta-cognitive knowledge (adapting metacognition). In summary, Winne believes that individuals who self-regulate "are more aware of task demands, can accurately estimate whether they have ability to meet those demands, are more efficacious in learning attribute outcomes to facets of learning under their control and have a repertoire of learning strategies they use appropriately under various learning conditions" (Muis, Winne, & Jamieson-Noel, 2007, p. 178).

Measuring Self-Regulation

To measure self-regulation, researchers have employed observational studies, interviews, and self-report questionnaires. Of these ways to measure self-regulation, self-report measures have been the most common (Winne & Perry, 2000). With self-report measures, students are asked to rate statements related to some dimension of self-regulation. Some self-regulation self-report examples include the Motivated Strategies for

Learning Questionnaire (MSLQ; Pintrich et al., 1991), the Learning and Study Strategies Inventory (LASSI; Melancon, 2002), and the Self-Regulated Learning Inventory (SRLI; Linder, Harris, & Gordon, 1996). These self-regulation self-report questionnaires measure the strategies of learning, information processing (cognitive processing), and motivation of students. The LASSI tends to primarily measure students' learning strategies, while the MSLQ focuses on both motivational and learning strategies. The LASSI and MSLQ focus on learning strategies and motivation but not external resources. The SRLI focuses on measuring self-regulation based on individual (e.g., motivation), environmental (e.g., technology), and social (e.g., teachers) factors.

Online Learning

In 1992, the World Wide Web was invented; consequently, educators in higher education began to implement, design, and deliver education using the web (Harasim, 2000). As technology advanced, delivery of higher education courses on the web resulted in new ways of teaching information given the ease of access, collaborative characteristic, and relative ease of using the web. With these new online teaching methods, demand for online courses has steadily increased in higher education. It has been well documented that higher education has grown over the years since 1992 with 1.6 million students in an online course in 2002 (Allen & Seman, 2004). Other sources such as the National Center for Educational Statistics (Waits & Lewis, 2003) have documented the continued increased demand for online learning in post-secondary educational institutes. Other researchers have also observed the increased demand (Keer, Rynearson, & Kerr, 2006) and have made predictions that it will be a key component in progressive education (Lightfoot, 2006). With increased demand, it is no surprise that

many higher education institutions believe that online education is critical to their long-term success (Allen & Seaman, 2004).

While the demand is clearly increasing, the definition of online learning is less clear (DeNeui & Dodge, 2006). It is certainly a different form of communication dependent on a “flow of electronic messages and images from the instructor to the students. Likewise, the students must communicate with the instructor and interact with peers in the class” (Lightfoot, 2006, p. 217). Allen and Seaman (2004) define an online course as having at least 80% of the course content delivered online. As described above, defining online learning can be difficult, yet it may be easier to account for the commonly used components of online learning rather than focusing on a clear and single definition. These components of online learning include the course management system, course mode, and online teaching medium (asynchronous and synchronous) will be described below in detail. Finally, online learning has led to benefits in education and at the same time presented new challenges to education that will be also examined.

Online course management systems refer to the web software used to deliver the course content online (Teng & Allen, 2005). Blackboard and WebCT are the most common examples which provide a place for students and instructors to access and communicate course content. In particular, they allow students to access the course materials, lecture notes, assignments and website links. In addition, they provide technology communication applications such as discussion boards, chat, and Wikis. While these course management systems may be increasingly common in higher education, they are not required to conduct an online course. Other methods have included e-mail, websites, and so forth.

Delivery mode refers to the manner the course is provided to the students. Harasim (2000) describes the three modes as “adjunct mode”, “mixed mode”, and the “totally online mode”. “Adjunct mode” is the traditional face-to-face classroom teaching that uses the online course delivery software to post assignments and/or the syllabus online. “Mixed mode” includes the use of more online course delivery software than adjunct mode. Finally, the “totally online mode” occurs when the entire course is taught online. The first two modes are often referred to as hybrids (Harasim, 2000). A more recent description of delivery modes are referred to as “fully online”, “blended/hybrid” course, and “web facilitated”. “Fully online course” refers to a course where 80% of the course content is delivered online. “Blended/hybrid courses” consists of 30% to 79% of the course content delivered online, often using online discussion boards, and the remainder of the course content is delivered face-to-face. “Web facilitated” refers to a course where 1% to 29% of the course content is delivered online and the course content consists of web pages, syllabus, and/or assignments (Allen & Seaman, 2004).

Online learning includes both asynchronous and synchronous teaching mediums, which refer to whether the online teaching is communicated in real-time or simultaneously (Waits & Lewis, 2003). An asynchronous medium is not communicated in real-time and primarily includes online discussion boards and e-mail (Tallent-Runnels et al., 2006). Discussion boards are electronic messages organized by subject/topic matter, often threaded, which allows students to participate in conversations by topic (Lieblein, 2000). The asynchronous medium is currently the most frequently used online medium since it is the most convenient for the instructor and students (Ho & Swan, 2007). In fact, e-mail, an asynchronous medium, is the most widely used medium in

online education (Lightfoot, 2006). Students taught using an asynchronous medium self-reflect more since they are allotted more time to review and respond to the online content instead of responding to conversations in real-time (in face-to-face courses) (Davidson-Shivers, Tanner, & Muilenburg, 2000).

The other medium, synchronous online activities, includes any teaching activities that are communicated online in real-time between students and their instructor. This medium is used in 43% of the Internet courses being offered (Hrastinski, 2006; Lieblein, 2000; Tallent-Runnels et al., 2006). Examples of this include the use of instant messenger chat (e.g., AIM, MSN messenger, ICQ, Yahoo messenger), video chat, live online lectures, and conference calling. Often, course management systems, such as Blackboard and WebCT, have their own version of online instant messenger chat applications.

A small collection of research articles has focused on determining which medium is the most beneficial in higher education. Research to address this question is limited since most of it focuses on asynchronous mediums in education (Hrastinski, 2006). However, there seems to be early indications that asynchronous learning may be more beneficial to students. Students in asynchronous classes participate more (Hrastinski, 2006; Teng & Allen, 2005), demonstrate increased communication between their fellow students, and instructors and students than in face-to-face classrooms (Teng & Allen, 2005). In addition, students have more time to reflect on the online asynchronous communications of fellow students before posting their electronic communications. While students seem to benefit from asynchronous mediums, students in synchronous

courses have commented on the social benefits of synchronous communications such as being less isolated and having a sense of community (Nicholson, 2002).

With benefits of online learning as described above for asynchronous and synchronous mediums, the challenges of online learning in higher education are also present. These include instructors' burnout and lack of technical knowledge, students' isolation, student drop-outs, and writing style. Instructor challenges may include their knowledge of technology (Rovia & Wighting, 2005) and more recently burnout (Hogan & McKnight, 2007). Their burnout can be attributed to more written work required to respond and post online communications than face-to-face courses. There have also been some early indications of students dropping out when enrolled in an online course (Dutton, Duttin, & Perry, 1999), which may be influenced by the level of self-directedness, skill of the instructors teaching online courses, or the isolation and alienation that is associated with online teaching (Rovia & Wighting, 2005). Other researchers have indicated the social consequences of online learning such as the lack of personal interaction between students and teacher and student and students (Star, 1998). Another challenge is the nature of the informal and free structure of written communication with e-mail and other online communications where the writing style may be abbreviated and have its own unique characteristics such as non-standard creative spelling (Lightfoot, 2006).

Role of Self-regulation and Academic Performance in On-online Environments

When investigating student characteristics related to online learning and academic performance, researchers have noted the lack of investigations (Kerr, Rynearson, & Keer, 2006). One student characteristic is the relationship between self-regulation and academic

performance (Whipp & Chiarelli, 2004). These studies tend to focus on ways to increase academic performance and/or self-regulation. Specifically they are focused on observing or enhancing features of self-regulation to improve academic performance such as self-observation, self-judgment, and reacting. For instance, Hantula (1998) has demonstrated that asynchronous communication requires more self-management. Another example occurred when Whipp and Chiarelli (2004) measured self-regulation in master's students enrolled in a web-based course on "Technology for Instruction and Assessment". The content of the course was delivered using a courseware package such as Blackboard which included asynchronous discussions via a discussion board. Their findings revealed that students who demonstrated high levels of self-regulation academically performed better in the class compared to other students who demonstrated lower levels of self-regulation.

Another study by Kerr, Ryanearson, and Kerr (2006) investigated the independent learning of undergraduate and graduate online students related to their course grades. Independent learning was defined as the "individual's ability to manage time, balance multiple tasks, set goals, and ones disposition regarding self-discipline, self-motivation, and personal responsibility" (p. 101). These independent learners shared many characteristics of self-regulated learners such as setting goals and being self-motivated. The results of the study demonstrated that online undergraduate and graduate students who displayed high independent learning received higher course grades.

Finally, there is some evidence that suggests that online learners who highly self-regulate do poorly academically in classes that are very structured and linear. However,

poor to medium self-regulators have increased academic performances when they are enrolled in very structured and linear classes (McManus, 2000).

Instructional Course Objectives

With more emphasis on accountability in education, such as No Child Left Behind in primary and secondary education, higher education has experienced pressure by the federal government and credentialing agencies to be more accountable (Klein, Kuh, Chun, Hamilton, & Shavelson, 2005). In higher education, accountability can include graduation rates, self-reports of learning, and ability of graduates to obtain employment. More recently, there is an emphasis on direct assessment of student learning which includes course grades, course papers, presentations and tests. With an emphasis on accountability in higher education, particularly with direct assessment, course design, including instructional course objectives, are important since they provide a measure or account of student learning (Harden, 2002).

Beginning in the 1960s (Harden, 2002), a number of researchers (Mager, 1997) have defined, identified, and described the parts and characteristics of instructional course objectives. Many of them define instructional course objectives as the intended learning outcomes of a student or what should be achieved and assessed of a student upon completion of the course. In other words, instructional objectives are what the student should know and/or do at the end of a course of study.

While the definition of instructional course objectives can be easily and clearly defined, the difficulty and complexity of writing well-written instructional objectives have been noted (Mager, 1997). Writing instructional objectives well, requires that the instructor consider a number of factors, which generally include what the learner should

do, the learning conditions, and some standard that the student should accomplish. Researchers seem to agree that these instructional objectives should clearly state the intended learning outcome under a designated learning condition. The objective should be observable and describe the level of competency to be attained. Another point of agreement is that these instructional objectives should be written for the intended audience. A detailed definition and description of instructional objectives will be presented below by the primary researchers in this area.

Grunland (2004) describes various ways instructional objectives should be written which should focus on teaching, learning, and assessment. More importantly, objectives should focus on the intended learning objectives rather than focus on a teaching procedure or student learning. The components of well-written instructional course objectives “include intended learning outcomes that provide effective goals for teaching and targets for assessment” (p. 4). He also suggests using Bloom et al.’s (1956) taxonomy as a guide to write instructional objectives. Bloom’s taxonomy includes recall, comprehension/understanding, application, synthesis, analysis, and evaluation (for a detailed description of Bloom’s taxonomy see Bloom et al., 1956).

Grunland’s model for writing instructional objectives for simple tasks includes writing a specific learning outcome (objective), teaching a specific task (can demonstrate it), and testing a specific task. For more complex tasks, Grunland suggests using a model where the following are used: “a) state and define the objective in terms of student performance b) provide a variety of learning experiences directed toward the objective and c) assess student achievement using a variety of assessment models” (p. 7).

Similarly, when writing clear instructional objectives, Grunland suggests that instructors should not state them in terms of a) teacher's performance (e.g., teach the students Vygotsky) b) learning process (e.g., gains or learns basic concepts of the zone of proximal development) c) subject matter topics (e.g., student learns language development) and, d) include two objectives in one statement. Clearly written instructional objectives should begin with a verb and more specific objectives should only use action verbs (e.g., identifies, describes, lists) as opposed to non-action verbs such as "realizes" or "sees". Action verbs are those that can specify and define observable behavior. Finally, and very important, the specific outcomes should be relevant.

Similarly, Mager (1997) states that an instructional objective should be written with the intended learning for students. In fact, Mager states, "a usefully stated objective is one that succeeds in communicating an intended instructional result to the reader. It is useful to the extent that it conveys to others a picture of what a successful learner will be able to do; and to the extent that the picture it conveys is identical to the picture the objective the writer had in mind" (p. 42). In writing well-written instructional objectives, three overall questions should be considered: what should the learner do (performance), under what conditions should the learner be able to do it (conditions), and how well it must be done (criterion/level of competence). For instance, when listening to a taped 10-minute conversation among 4-year olds, a student should be able to identify egocentric speech 80% of the time.

Mager (1997) specifies important characteristics of well-written instructional objectives. These include parallel formatting (e.g., all objectives begin with a verb instead

of a noun), detailed objectives that are overt, visible, or observable (e.g., joy, anger, and fear), and the selection of verbs. When selecting verbs, it is important to select verbs that cannot be interpreted in more than one way. Finally, instructional objectives should specify a level of competence, criteria, rate (i.e., a timeline on when then objective should be obtained or learned), quantity, accuracy, and/or quality. For instance, a person's ability to calculate a summation of two single digits can be specified in how long, how many, and whether they correctly answer the question. Finally, consideration of the audience is an important factor such as writing instructional objectives for undergraduate students enrolled in a language development course versus undergraduate students majoring in language development.

Heinich, Molenda, Russel, and Smaldino (2002), similar to Mager (1997) and Grunland (2004), define instructional objectives as “what learning outcome is each learner expected to achieve? More precisely, what new capability should learners possess at the completion of instruction” (p. 58). Similar to the above authors, they believe that the objectives should be as specific as possible. They also believe that a well-stated objective will have the following four characteristics: names the audience it is intended for, behavior or capability to be observed, conditions the behavior will be observed, and a standard or criteria to be achieved. They refer to this as the ABCDs of well-stated objectives: A= audience, B=behavior, C=conditions and D=degree. First, audience (A) is writing an objective that focuses on the student's learning and not the teacher teaching; therefore, any instructional objectives referring to teaching are avoided. Second, behavior (B) refers to the selection of a verb that clearly describes the objective. Verbs such as understand, know, and appreciate should be avoided and instead verbs such as define,

demonstrate and categorize should be used. Finally, the behavior should be relevant or something the learners should need in the “real-world”. Next, conditions (C) are under what situation the behavior would be observed. Finally, the degree (D) or criterion that will be considered acceptable performance. Other criteria of “D” include time and accuracy.

The use of instructional course objectives has had mixed results in improving learning and increasing academic performance (Martin, Klein, & Sullivan, 2007). Some researchers have shown increased academic performance while others have shown it has no effect on academic performance. For instance, Hege, Siebeck, and Fischer (2007) have demonstrated that instructional course objectives have increased academic performance. On the other hand, Hartley and Davies (1976) demonstrated that instructional course objectives show no effects on academic performance. Despite the mixed results of instructional objectives on academic performance, educators have emphasized the importance of learning outcomes and significance to accountability in higher education (Harden, 2002).

Self-Regulation, Instructional Objectives, and Learning Environments

As described earlier, a successful self-regulator sets goals, plans, and executes them and then uses evaluative criteria or performance standards to adjust or maintain a performance (e.g., Bandura’s judgemental process). In Zimmerman’s model of self-regulation, the ability to self-observe, set goals and evaluate a performance are related to the ability to observe behaviors and set criteria to judge one’s performance. As stated earlier, Zimmerman, Bandura, and Winne’s theories on self-regulation discuss the roles of the learner seeking external information as a characteristic of self-regulation. For

undergraduate students, successful self-regulators may develop their plan and establish their performance standards based on experiences or external information such as referring to instructional objectives listed on a course syllabus. If students rely on the instructional objectives in an undergraduate classroom to create, set a plan and evaluate their own performance standards then the quality of the instructional objectives (poorly versus well-written) may affect their ability to successfully self-regulate. Given the early research suggesting that online students require more educational guidance (intended learning outcomes), online students may require well-written instructional objectives more so than students in a traditional classroom to successfully self-regulate and academically perform well. In fact, Hodges (2005) suggests guided self-regulation for students in web-based courses. He states that “research indicates that building self-regulatory scaffolding into web-based course or simply providing instruction on self-regulation can be effective components of a course” (p. 381). Perhaps guided self-regulation includes well-written instructional objectives. Similarly, Grunland (2004), a major researcher on instructional objectives, states that instructional objectives allow for self-assessment of learning, especially if students become independent learners. Instructional objectives allow students to evaluate their progress and develop self-assessment skills. It seems obvious that successful self-regulating students will devise their plans and evaluate themselves using internal and/or external resources. Therefore, instructional objectives, especially well-written ones, can possibly enhance self-regulation to have an increased effect on a student’s learning and academic performance.

Two research studies suggest that instructional objectives can have an affect on increasing student’s self-regulation. First, Ausubel (as cited in Martin, Klein, & Sullivan,

2007) has indicated that instructional objectives presented before a class begins can help students in structuring their own learning. Reiser and Dick (1996) state that “by knowing what will be expected of them, learners may be better able to guide themselves through that process” (p. 48). Finally, Narciss, Proske, and Koerndle (2007) acknowledge that undergraduate students in an online course are provided with a vast amount of information, which they will need to self-regulate to achieve academic success. Unfortunately and often, there is no guidance from their instructors on how to self-regulate. They believe that students who self-regulate match their learning objectives to manage the vast information of an online course.

The above studies suggest that instructional objectives can increase both academic performance and self-regulation among undergraduate students in an online course. For online undergraduate students to manage the vast amount of information, it is important for them to self-regulate successfully. To do this, they will need to obtain ways to do so which can be achieved by setting and evaluating their goals by using instructional objectives.

Significance and Uniqueness of the Study

The literature review provided a context for the importance and uniqueness of the variables presently being investigated in higher education. These variables include self-regulation, course delivery (online or face-to-face), instructional course objectives, and academic performance. Research examining these four variables together or in different combinations has been both important and unique, and yet very few studies have been reported. As a conclusion of the literature review, there are no studies that specifically investigate whether the quality of instructional objectives affects academic performance

and self-regulation in online or traditional (face-to-face) courses among undergraduate students. With no studies examining these four variables simultaneously, the research question posed in this study will be a unique addition to the current body of literature in educational psychology. In particular, this study will demonstrate a method of measuring accountability in higher education (instructional objectives affecting academic performance) in an online learning setting (and non-online). In addition, it addresses whether online or non-online instructors can improve the quality of higher education by writing quality instructional objectives as it may increase self-regulation and academic performance among undergraduate students.

CHAPTER 3

METHOD

Participants and Design

A total of 76 Temple University undergraduate students enrolled in four sections of the Spring 2008 “The Developing Individual Across the Lifespan (1322/122)” constituted the sample. The design was a quasi-experimental four-group post-test only design, involving the comparison of two levels of course format (delivery mode: online vs. face-to face) and two levels of instructional objectives (quality: well-written vs. poorly written). Dependent variables included students’ self-regulation (i.e., total SRLI) and academic performance scores (i.e., “estimated known GPA”, “if you were grading yourself, what grade would you give yourself”, and “ language development quiz”). A convenience sample was used such that when assigning the students to each of the class conditions, the two instructors (instead of the lecturer) who taught the four classes assigned students to one of the instructional objective conditions in each of their sections. For the course delivery, the two instructors decided among themselves the type of course delivery. One instructor decided that students in both sections he taught would be assigned to the face-to-face course delivery condition while the other instructor had his students assigned to the online course delivery condition. Students assigned to one of the face-to-face and an online course condition were given well-written instructional objectives opposed to poorly written instructional objectives--which were given to students enrolled in the remaining two course sections (see Table 3.1). When assigning students to an instructional course objective condition, the instructors of the course

assigned them to a class with well or poorly written instructional objectives; therefore, the lecturer (researcher) was blind to conditions.

Table 3.1. *Course Information for the Spring 2008 The Developing Individual Across the Lifespan (1322/122) Course*

Section	Course Number	CRN	Course Delivery	Duration of Class	Quality of Instructional Objectives	Number of Students
001	122/1322	017600	Face-to-Face	50 minutes	Poorly written	12
002	122/1322	017611	Face-to-Face	50 minutes	Well-written	12
005	122/1322	017633	Online	7 days	Well-written	22
006	122/1322	016662	Online	7 days	Poorly written	30

Alternative research designs.

The current design was selected since it represented the least amount of practical issues to successfully conduct this study. However, given the selected design several limitations are present which are discussed in detail in Chapter 5. While the researcher recognized these limitations, alternative research methods were considered but not selected given the practical considerations. Practical considerations and other alternative designs are discussed below.

First, obtaining permission from instructors and departments at Temple University to conduct research during a regularly scheduled class was often not permitted. Similarly, asking permission to conduct research for a class period from instructors within the researcher's department was also denied except for those two

instructors' classes used in this study. Another consideration that presented practical challenges was using students for this study from the researcher's courses at Saint Joseph's University. Using students from Saint Joseph's University was quickly abandoned because of other practical considerations such as receiving permission from the Chair, Dean, and completing an additional IRB application. In fact, it was unclear whether the Chair, dean, or the IRB committee at Saint Joseph's University would have permitted the study to occur. Finally, using the same post-test measures included in this design as pre-test measures would probably have led to students (participants) to experience survey burnout. In addition, instructors of these students may have not agreed to use the pre and post-test measures therefore not allowing this study to progress. Finally, the use of a control group was considered but abandoned once the researcher discovered that students could be only recruited for four courses. Consequently, the minimum requirements for a sample size were marginally met to conduct an analysis.

Because of the limitations of the proposed design two alternative research designs were considered for this study. A four treatment group pre and post-test quasi-experimental design with the option of having two control groups was the first alternative research design considered. The second alternative research design was a six group pre and post-test design wherein two of the six groups constituted the control groups.

Similar to the design used in this study, a four group pre and post-test, quasi-experimental design with the option of two control groups was considered as an alternative research design. The sample would consist of students from the four classes that were used in the selected research design. The two instructors (instead of the lecturer) who taught the four classes would assign students to one of the instructional

objective conditions in each of their course sections. In group one, students in one course would be assigned by their instructors to be in the face-to-face class with well-written instructional objectives. In group two, students would be assigned by their instructors to be in the online class with well-written instructional objectives. In group three, students would be assigned by their instructors to be in the face-to-face class with poorly-written instructional objectives. In group four, students would be assigned by their instructors to be in the online class with poorly-written instructional objectives. The option of having two control groups would consist of one class where students would participate in a face-to-face classroom with a 45 minute educational video on language development. The second control group would ask students to participate in an online course to view the same 45 minute educational video on language development on Blackboard that the face-to-face student viewed. In all the groups, students would be asked to complete all the outcome measures used in the current study prior and after participation in the study instead.

The second alternative research design was a six group experimental group. In this design undergraduate students in the four experimental groups would be asked to complete an instructional task such as identifying different phonological sounds (e.g., “cooing”, “babbling”) when watching a video of children interacting with others by making phonological sounds. Before the instructional task they would be given and asked to complete the questionnaires, read the instructional objectives for the class, read an excerpt on phonological development of children, listen to a short 10 minute lecture on the topic, and asked to complete the instructional task. The instructional objectives and course delivery would vary by each group. Group one would receive poorly-written

instructional objectives and would have this delivered in a face-to-face course delivery. Group two would receive well-written instructional objectives in a face-to-face course delivery. Group three would receive the poorly written instructional objectives and would have this delivered in a face-to-face course delivery. Group four would receive the well-written instructional objectives in a face-to-face course delivery. Finally, in groups five and six, the control groups, students would be asked to watch the same video presented to the other four groups on children interacting with others by making phonological sounds. Specifically, group five would watch the video online and group six would watch the video in a face-to-face course delivery environment. In all the groups, students would be asked to complete all of the outcome measures used in the current study prior and after participation in the study. Given all of the alternatives and the various problems associated with implemented these designs, the design chosen for this study seemed the most practical while maintaining an adequate degree of internal validity.

Secondary Research Question

The secondary research question sought to examine the relationship among eight variables using a correlational design. The first three variables were comfort with computers, Internet and Blackboard. The fourth variable was frequency of Blackboard use. The next two variables were instructional objectives (poorly or well written) and course delivery. Finally, the remaining two variables were students' self-regulation scores (i.e., SRLI- executive processing, SRLI-cognitive processing, SRLI-motivation, and SRLI-environmental control/utilization and SRLI-total), and academic performance scores (i.e., "estimated known GPA", "if you were grading yourself, what grade would you give yourself", and " language development quiz").

The first four variables were from the demographic measure: “Please rate your comfort level with using a computer (circle one)?”, “Please rate your comfort level with using the Internet (circle one)?”, “If yes to the above question, please rate your comfort level with using Blackboard (circle one)?”, and “How often have you used Blackboard?”. These three questions (“Please rate your comfort level with using a computer (circle one)?” “Please rate your comfort level with using the Internet (circle one)?”, and “If yes to the above question, please rate your comfort level with using Blackboard (circle one)?”), had three response categories: high, middle, and low comfort level. The three comfort level type questions were students’ collapsed responses based on the following; high includes “very comfortable“ and “somewhat comfortable”, middle includes “comfortable” and low comfort level includes “somewhat uncomfortable” and “very uncomfortable”. These response categories were collapsed to assist in later interpretation of the results. Finally, “How often have you used Blackboard?” had four response categories which were “always”, “sometimes”, “rarely”, and “never” and was also from the demographic measure. The next two variables had two levels each. The first variable, instructional objectives had two levels: well-written instructional objectives and poorly written instructional objectives. The next variable, course format included two levels which were the face-to-face course delivery and online course delivery.

Measures

A total of four questionnaires were used in this study. A 10-item multiple choice quiz on the language development lecture was immediately administered to students in all sections after the language development lecture. The remaining three questionnaires included a demographic questionnaire (also included questions on class performance and

familiarity with computers, Internet, and Blackboard, and frequency of Blackboard use), quality of instructional objectives questionnaire, and one standardized measure on self-regulation. Students who participated in the online course completed the quiz and the three questionnaires after they completed the lecture on language development online. A week before the online course was available to students, the online students received a packet with the four questionnaires and specific instructions on when to complete the questionnaires. The time to complete the questionnaires was about 20 to 30 minutes.

Language development quiz. The 10-item four option multiple choice quiz on the language development lecture was developed by the researcher and administered to the students after the language development lecture. The quiz was developed by the researcher to ensure that the content of the exam would correspond to the lecture the research would deliver in the classes. The content for the quiz was based on the lecture outline on language development. During the development of the quiz, instructors of the courses were asked to review the quiz and send feedback to the researcher. The received feedback was used to improve the questions on the quiz.

Demographic questionnaire. The demographic questionnaire included items developed by the researcher to collect information about the participants' age, gender, ethnicity, class status (e.g., freshman), major, and desired career. It also included questions on the students' perception of their class performance (e.g., estimated GPA) and familiarity and comfort on using computers, Internet, and Blackboard. The final question was on the frequency of Blackboard use.

Quality of instructional objectives questionnaire. A questionnaire on the quality

of the instructional objectives (QIOQ) was also developed by the researcher to assess whether the students perceived the instructional objectives as well-written. Students were asked to rate eleven statements on a 5-point Likert scale (Strongly Agree to Strongly Disagree). Some of the questions included “I thought that the instructional objectives were easily understood?”, “I thought that the instructional objectives were helpful to my learning?” and “I thought that the instructional objectives helped me assess and evaluate my learning?” The questionnaire was developed by the researcher. The QIOQ demonstrated sound psychometric properties (e.g., Cronbach’s alpha = .902)

Self-regulated learning inventory. The Self-Regulated Learning Inventory (SRLI; Lindner & Harris, 1992) is a standardized self-report questionnaire designed to measure self-regulated learning. The inventory includes four subscales which are executive processing, cognitive processing, motivation, and environmental control/utilization with each of the subscales reporting reliabilities greater than .78 (Cronbach’s alpha) and for the total inventory .93 (Cronbach’s alpha). The cognitive processing (more or less conscious), motivation, and environment control/utilization scale were derived from the work of Zimmerman and Martinez-Pons (1986a, 1986b). The executive processing is the agent of cognition such as reflection and decision making. Environmental control/utilization is the ability to adapt to uncertain challenges in the classroom.

The SRLI consists of 80 items on a 5 point Likert scale with responses ranging from “5” equals “almost always typical of me” to “1” equals “not at all typical of me”. An item example is provided for the four subscales in Table 3.2. Each subscale has 20 items, with a maximum score of 100. The maximum score for the total SRLI measure is 400.

Table 3.2. *Self-Regulated Learning Inventory Item Subscale Examples*

Subscale	Example Item
Executive Processing	“When reading a text or listening to a lecture, I consciously attempt to separate the main ideas from the supporting ideas.”
Cognitive Processing	“I come to class session prepared to discuss the assigned reading material (e.g., chapter, handout, articles).”
Motivation	“Mastery of new knowledge of skills is more important to me than how well I do compared to others.”
Environmental utilization/control	“If I am struggling to understand the material presented in a course, I try to get some useful hints from someone who does.”

Development of instructional objectives. When developing the instructional objectives for the language development classes that appear in Table 3.3, the researcher created a set of poorly and well-written instructional objectives based on the writing guidelines on course objectives discussed in the literature review (see Chapter 2). After, an expert review consisting of three Temple University faculty who were familiar with writing instructional objectives were asked to review the instructional objectives developed by the researcher. They completed the review using an online survey software called SurveyMonkey. The review required that the faculty members classify the instructional objectives as poorly or well-written. The instructional objectives appeared in a random order on the online survey. If two of the three faculty members choose one

classification (poorly or well-written) for an instructional objective, then that instructional objective would be classified as such (either poorly or well-written). Results of the final classification are presented in Table 3.3.

Procedure

Before students were able to participate in this study, they were given written informed consent which they were asked to review and sign. The informed consent emphasized that participation in the study was voluntary and they were able to withdraw from the study at any point. If they decided to withdraw or declined to participate in the study, they would not be required to make up the missed lecture (online or face-to-face) on language development with their instructor.

For the face-to-face class, the language development lecture occurred during one class of the course as regularly scheduled. For the online language development class lecture, a video of the class lecture was digitally recorded from the face-to-face class lecture and students were able to access it a week later on Blackboard. The lecturer for both sections of the course was the researcher, a 34-year-old Hispanic male doctoral student enrolled in the Educational Psychology program at Temple University.

Table 3.3. *Instructional Objectives Used for the Developing Individual Across the Lifespan Courses (1322/122)*

Poorly-Written Instructional Objectives	Well-Written Instructional Objectives
Gain knowledge of multicultural influences	Identify at least 70% of the terms of language development terminology from the prelinguistic period to adolescents when participating in class activities such as listening to recording or a transcript of children age 6 months to eight years old
The instructor will find ways to have students learn knowledge of language development throughout each stage	Recognize, identify, and understand the components, structures, and key terms of language
Retell the developmental process of language from the prelinguistic period to adolescents after reading the assignment and participating in class discussions	Evaluate the similarities and differences between the Nativist, Empiricist, and Interactionist perspectives of language development
Students will learn and know the differences between the perspectives of language development	Explain the Nativist, Empiricist, and Interactionist perspectives of language development after reading the assigned reading and listening to the class lecture
Comprehend the language development throughout each stage	Identify at least two possible multicultural influences on language development when given a case study
Summarize the developmental process of language development from the prelinguistic period to adolescents after reading the assignment and participating in class activities	Describe all the components of language development which include phonology, semantics, syntax, and pragmatics when asked orally or on a written examination and/or quiz
Explain influences on language development among children in the prelinguistic period to adolescents after reading the assigned reading and listening to the class lecture	

Table 3.3. *Instructional Objectives Used for the Developing Individual Across the Lifespan Courses (1322/122) Course*

Poorly-Written Instructional Objectives	Well-Written Instructional Objectives
Understand the key terms of language development	
The instructor and audio visual materials will teach students theoretical perspectives of language development	
Students learn the influences of language development according to all the major theorists discussed	

After students agreed to participate in the study and prior to the lecture on language development, students participating in the study were provided with instructional objectives that varied on whether they were well or poorly written. Again, the lecturer (researcher) did not know which of these conditions the students would be assigned to since the instructor assigned the instructional objectives for each class. Students in the face-to-face classes were provided with a one page hand-out listing either the poorly or well-written instructional objectives. Students in the online classes were provided with poorly or well-written instructional objectives when they immediately logged onto Blackboard, prior to any other online course activity.

After the instructional objectives were provided in either the online or face-to-face classes, a lecture on language development was delivered to students in person or online via a digital video recording. In the face-to-face classes, the researcher delivered a 30-minute lecture on language development which was digitally recorded. The digital

video of the language development class recorded in section 001 was available a week later for the online students to access and view on Blackboard. In addition, the online students were informed and asked to participate in the online course activities when they logged into Blackboard. These other online course activities to deliver the class content included discussion boards, lecture notes, and e-mail. The duration of the online class on language development was a week where students were asked to view the online lecture video, read any online material posted on Blackboard, and respond to any discussion board threads on language development. After a week, the online students were not permitted to access any material for this course. The duration of the face-to-face language development classes was approximately 30 minutes in length. For both the face-to-face and online lecture, the content areas on language development consisted of: language development in infancy and toddlerhood (birth to two years old), early childhood (two to six years old), middle childhood (seven to eleven years old), and teenage and adulthood (12 years and older): theories (e.g., behavioral, nativist (biological), and interactionist), terms (e.g., cooing, babbling, telegraphic), errors (e.g., underextension and overextension), production, comprehension, and influences (e.g., social, cultural, economic, and parental).

Immediately after the language development lecture (both online and face-to-face), students were asked to complete a 10-item multiple choice quiz on language development which was not used to calculate students' course grade. For students in the online class, they completed their online activities prior to the close of the class on language development using Blackboard (a week after beginning the online course activities). A demographic questionnaire with questions on their class performance and

comfort and familiarity with computers and frequency of Blackboard use was also administered. The remaining questionnaires included a quality of instructional objectives questionnaire and one standardized questionnaire on self-regulation. The total time required to complete these questionnaires was approximately 20 to 30 minutes.

CHAPTER 4

RESULTS

The sample used in this study consisted of 76 undergraduate Temple University students enrolled in four sections of the Spring 2008 “The Developing Individual Across the LifeSpan (1322/122)” course. The students in this sample had a mean age of 19.89 and standard deviation of 2.06. Other demographic information for this sample are reported in Table 4.1.

Table 4.1. *Descriptive Statistics for Demographic Characteristics of Undergraduate Students*

Characteristic	<i>N</i> (%)
Gender	
Male	21 (27.6)
Female	55 (72.4)
Ethnicity	
White	53 (69.7)
African-American	10 (13.2)
Hispanic	7 (9.2)
Asian	4 (5.3)
Other	2 (2.6)
Class status	
Freshman	27 (35.5)
Sophomore	23 (30.3)
Junior	21 (27.6)
Senior	4 (5.3)
Other	1 (1.3)

Note. *N* = number of students, % = percent of students

Before statistical analysis addressed the questions raised in this study, the data was entered into a statistical data analysis program. The Statistical Package for the Social Sciences (SPSS), the statistical data analysis program, was used to ensure quality of the data entry and to conduct the statistical analysis for this study. All of the data entered into

SPSS were systematically reviewed to ensure their accuracy resulting in no data entry errors.

The primary purpose of the study was to examine the relationship between the quality of instructional objectives and course delivery methods on academic performance and self-regulation. The specific questions raised in this study were: 1) Does the quality of instructional objectives affect self-regulation and academic performance more in an online course than a face-to-face (traditional) course in higher education among undergraduate students? 2) Is there a relationship between the quality of instructional objectives, comfort and familiarity with computers, Internet, and Blackboard, and frequency of Blackboard, self-regulation (i.e., total SRLI and SRLI subscales), academic performance among undergraduate students? And how is this relationship affected by course delivery and the quality of instructional objectives?

Primary Research Question

Mean analysis. A number of means and standard deviations to address the primary question of this study were analyzed. The first of these included a comparison of means and standard deviations on academic performance and SRLI scores across course delivery and instructional objectives (see Tables 4.2, 4.3, 4.6, 4.7). In addition, Tables 4.4 and 4.8 report the means and standard deviations on academic performance and SRLI scores for students in the face-to-face classes who received well or poorly-written instructional objectives. Tables 4.5 and 4.9 report the means and standard deviations on academic performance and SRLI scores for students in the online classes who received well or poorly-written instructional objectives.

Table 4.2. *Descriptive Statistics for the Quality of Instructional Objectives across Academic Performance Variables and Total SRLI Score*

	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Quality of instructional objectives				
Poorly written	3.12 (0.46)	8.69 (1.12)	5.40 (1.70)	262.69 (29.58)
Well written	3.24 (0.49)	8.56 (1.37)	5.38 (1.81)	271.57 (24.68)

Note. “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400.

Table 4.3. *Descriptive Statistics for Course Delivery across Academic Performance Variables and Total SRLI Score*

	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Course delivery				
Face-to-Face	3.30 (0.37)	8.08 (1.35)	6.00 (1.69)	270.00 (26.61)
Online	3.11 (3.17)	8.88 (1.23)	5.12 (1.70)	264.90 (28.29)

Note. “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400.

Table 4.4. *Descriptive Statistics for the Quality of Instructional Objectives and Face-to-Face Course Delivery across Academic Performance Variables and Total SRLI Score*

Face-to-Face course delivery				
	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Quality of instructional objectives				
Poorly written	3.25 (0.37)	8.00 (0.95)	6.17 (1.64)	261.92 (27.49)
Well written	3.36 (0.39)	8.17 (1.70)	5.83 (1.80)	278.08 (24.12)

Note. “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400.

Table 4.5. *Descriptive Statistics for the Quality of Instructional Objectives and Online Course Delivery across Academic Performance and Total SRLI Score*

Online course delivery				
	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Quality of instructional objectives				
Poorly written	3.06 (0.49)	8.97 (1.07)	5.10 (1.65)	263.09 (31.21)
Well written	3.18 (0.54)	8.77 (1.15)	5.14 (1.81)	267.22 (24.75)

Note. “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400.

Table 4.6. *Descriptive Statistics for SRLI Subscales across Course Delivery*

	SRLI-executive processing	SRLI-cognitive processing	SRLI-motivation	SRLI-environmental utilization or control
Face-to-Face course delivery	66.21 (8.09)	68.21 (7.81)	71.33 (9.17)	64.25 (7.83)
Online Class course delivery	63.48 (10.84)	68.76 (7.81)	67.94 (8.01)	62.13 (10.26)

Note. Each SRLI subscale ranges from 0 to 100.

Table 4.7. *Descriptive Statistics for SRLI Subscales across the Quality of Instructional Objectives*

	SRLI-executive processing	SRLI- cognitive processing	SRLI- motivation	SRLI- environmental utilization or control
Poorly written	64.18 (10.57)	68.18 (8.42)	68.13 (7.14)	62.00 (9.96)
Well written	64.69 (9.45)	69.03 (9.29)	70.25 (9.92)	63.82 (9.01)

Note. Each SRLI subscale ranges from 0 to 100.

Table 4.8. *Descriptive Statistics for SRLI Subscales across Face-to-Face Course Delivery*

Face-to-Face Course Delivery				
	SRLI-Executive Processing	SRLI- Cognitive Processing	SRLI- Motivation	SRLI- Environmental Utilization or Control
Poorly written	64.58 (10.43)	67.00 (8.93)	67.92 (6.12)	62.42 (8.45)
Well written	67.83 (4.69)	69.42 (6.67)	74.75 (10.64)	66.08 (7.03)

Note. Each SRLI subscale ranges from 0 to 100.

Table 4.9. *Descriptive Statistics for SRLI Subscales across Online Course Delivery*

Online Course Delivery				
	SRLI-executive processing	SRLI- cognitive processing	SRLI-motivation	SRLI- environmental utilization or control
Poorly written	64.00 (10.83)	68.70 (8.30)	68.22 (7.66)	61.81 (10.73)
Well written	62.80 (11.10)	68.82 (10.60)	67.55 (8.64)	62.52 (9.89)

Note. Each SRLI subscale ranges from 0 to 100.

Further analysis to address the primary research question, the interaction of the two independent factors (quality of instructional objectives and course delivery), a 2 X 2 MANOVA was utilized to determine whether this interaction significantly differed on the outcome variables of academic performance (i.e., estimated GPA, grade you would give yourself, language development quiz) and self-regulation (i.e., SRLI total score). The results of the interaction produced no significant results. Similarly, the main effect of quality of instructional objectives demonstrated no significant results. However, the main effect of course delivery demonstrated significant results with a large effect size ($p = .013$, $\eta_p^2 = .193$) (Cohen, 1992). Although power was reported less than .80 for instructional objectives and the interaction between instructional objectives and course delivery, power was reported at .83 for course delivery. Tables 4.10, 4.11, and 4.12 show the results of the MANOVA.

Table 4.10. *MANOVA Main Effect and Interaction Results*

	Wilk's lambda	<i>F</i>	<i>Sig.</i>	Partial eta squared
Quality of instructional objectives	.938	.962	.435	.062
Course delivery	.807	3.47	.013*	.193
Quality of instructional objectives X course delivery	.979	.317	.865	.021

Note. Asterisks denotes $p < .05$

Table 4.11. *MANOVA Outcome Variable Results for Course Delivery*

	<i>F</i>	<i>Sig.</i>	Partial eta squared
Estimated GPA	1.84	.181	.029
Grade you would give yourself	7.71	.007*	.112
Language development quiz	4.49	.038*	.069
Total SRLI	.463	.499	.008

Note. Asterisks denotes $p < .05$

Table 4.12. *MANOVA Outcome Variable Results for Interaction of the Quality of Instructional Objectives and Course Delivery on Academic Performance and Self-Regulation*

	<i>F</i>	<i>Sig.</i>	Partial eta squared
Estimated GPA	.049	.825	.001
Grade You Would Give Yourself	.374	.543	.006
Language Development Quiz	.042	.838	.001
Total SRLI	.714	.401	.012

Secondary Research Question

Correlation analysis on demographic variables, comfort with technology, Blackboard use, academic performance and self-regulation. To address the second question raised in this study, Pearson *r* correlations on demographic variables, comfort with technology (i.e., computer, internet, and Blackboard), Blackboard frequency use, academic performance and self-regulation variables were conducted and are presented in Appendix A. For the relationship between the demographic and academic performance variables, only one Pearson *r* correlation was significant and weak ($r = .30, p = .01$) between gender and estimated GPA . Similarly, Pearson *r* correlations were ran among the comfort variables and frequency of Blackboard use on academic performance and self-regulation scores. As a result, one significant relationship occurred which was comfort with Blackboard and the grade the student gave themselves had a significant weak positive correlation ($r = .24, p = .04$).

Correlation analysis on comfort with technology, Blackboard use, academic performance, and self-regulation across instructional objectives and course delivery. To

further address the second question raised in this study, Pearson r correlations were conducted on the quality of instructional objectives, course delivery, computer comfort level, internet comfort level, frequency of Blackboard use, academic performance, and self-regulation. The academic performance variables were “estimated known GPA , “if you were grading yourself, what grade would you give yourself” from the demographics measure and the results of the language development quiz. The self-regulation measure was the total result of the SRLI. The results of the Pearson r correlation analysis indicated that a moderate positive and significant correlation ($r = .56, p < .05$) existed between Blackboard comfort level and the grade the student would give themselves for students in the face-to-face classes. Another moderate positive and significant correlation existed between Blackboard frequency use and the total SRLI score ($r = 0.41, p < .05$) for students in the face-to-face classes. For students who received the well-written instructional objectives, moderate and significant correlation ($r = .35, p < .05$) existed between Blackboard comfort level and grade students would give themselves. Similarly, a moderate and significant correlation ($r = .34, p < .05$) existed between frequency of Blackboard use and grade students would give themselves for students who received the poorly-written instructional objectives. Further Pearson r correlations of the variables listed above are reported in Appendix B.

Correlation analysis on comfort variables, Blackboard use, and SRLI subscales across instructional objectives and course delivery. Further correlations were conducted to investigate the relationship of the quality of instructional objectives, course delivery, computer comfort level, internet comfort level, and Blackboard comfort level, and frequency of Blackboard use on the SRLI subscales. Two significant positive correlations

occurred of moderate strength with students in the face-to-face class. The first of these correlates was between frequency of Blackboard use and SRLI-executive processing ($r = .44, p < .05$). The other Pearson r correlation was between frequency of Blackboard use and SRLI-environmental/utilization control ($r = .52, p < .05$). When examining Pearson r correlations across the two instructional objectives, two Pearson r correlations resulted in moderate and weak significant correlations. The first of these significant correlations was between frequency of Blackboard use and SRLI-executive processing for students receiving the well-written instructional objectives ($r = .41, p < .05$). The other significant correlation was between frequency of Blackboard use and SRLI-cognitive processing for students receiving the well-written objectives. ($r = .35, p < .05$). The remaining Pearson r correlations for the variables listed above are presented in Appendix C.

Partial Correlations

In addition to Pearson r correlations, several partial correlations were conducted to examine any mediating effects between the variables. First, partial correlations were conducted to examine the relationship between course delivery (online or face-to-face) and academic performance variables (i.e., estimated GPA, grade you would give yourself, and language development quiz) while controlling for total SRLI score. Second, total SRLI and academic performance variables (i.e., estimated GPA, grade you would give yourself, and language development quiz) were partially correlated while controlling for course delivery. Also, a partial correlation was conducted between course delivery and total SRLI while controlling for instructional objectives. The final partial correlation conducted was between instructional objectives and total SRLI while controlling for

course delivery. Results indicated that none of the partial correlations demonstrated any significant effects ($p < .05$).

CHAPTER 5

DISCUSSION

Primary Research Question

The primary purpose of the study was to investigate whether course delivery (i.e., face-to-face and online) and instructional objectives (i.e., poorly-written and well-written) could affect academic performance (i.e., estimated GPA, grade you would give yourself, and language development quiz) and self-regulation (e.g., total SRLI score). In particular, the interaction between course delivery and instructional objectives as they affect the aforementioned outcome variables was the major focus of the study. Results from the 2 X 2 MANOVA demonstrated an insignificant interaction between course delivery and instructional objectives on academic performance and self-regulation (see Tables 4.10 and 4.12).

Interaction effects. The results demonstrated that course delivery and instructional objectives did not significantly affect self-regulation and academic performance among undergraduate students. Since this is the first time a study of this nature has been conducted, there are no research studies, at the present time, to support or refute these findings.

Course delivery effects. The main effects of the 2 X 2 MANOVA indicated that course delivery had a significant and large effect size ($p = .013$, $\eta_p^2 = .193$). The effect of course delivery on specific academic performance variables revealed that the grade you would give yourself ($p = .007$, $\eta_p^2 = .112$) and language development quiz scores ($p = .038$, $\eta_p^2 = .069$) resulted in significant and medium to large effect sizes. In this study, results of the outcome variable mean scores were higher for students in the face-to-face

classes than the online classes. Specifically, students participating in the face-to-face classes had increased academic performance and self-regulation mean scores with the exception of the grade you would give yourself.

The main effects of the 2 X 2 MANOVA support a body of research demonstrating course delivery can impact academic performance. Research supporting that face-to-face courses increase academic performance more than online courses are mixed. In one instance, research literature supports that face-to-face courses increase academic performance (Kefe, 2003). In another instance, studies demonstrated that students in online courses perform better academically (Lim, 2005; Maki, Maki, Patterson, & Whitaker, 2000; Russell, 1999). Finally, more studies indicated that course delivery had no effect on academic performance (Summers, Waigandt, & Whittaker, 2005; Tallent-Runnels et al., 2006). While course delivery had varying effects on academic performance outcomes in previous studies, the results of this study demonstrated that students in the online classes had significantly higher academic mean score (i.e., “grade you would give yourself”). These findings are consistent with the results of a small body of literature (Hantula, 1998, Keer, Ryaneerson, & Keer; 2006; McManus, 2000; Whipp & Chiarelli, 2004).

Quality of instructional objectives effects. Unlike course delivery where the main effect for course delivery was significant, the main effect for instructional objectives was not significant. Nonetheless, results from this study were unlike studies that indicated that both poorly and well-written instructional objectives increased academic performance. However, other studies do corroborate that the use of instructional objectives results in no significant differences in academic performance among students (Martin, Klein, &

Sullivan, 2007). Finally, for self-regulation there are no studies that have shown that well-written instructional objectives increase self-regulation.

Self-Regulation Learning Inventory subscales. Detailed examination of self-regulation processing as related to academic performance outcomes for students receiving varying instructional objectives and course delivery mediums were analyzed across the four Self-Regulation Learning Inventory (SRLI) subscales. While no research exists that examines the relationship between SRLI subscales and course delivery, Lindner, Harris, and Gordon (1996) demonstrated that his face-to-face students in their study had very similar mean SRLI subscale scores as the face-to-face students did than the online students in this study. For instructional objectives, students who received well-written instructional objectives had slightly higher mean scores on all four SRLI subscales than those students receiving poorly written instructional objectives. Again, research examining specific relationships to SRLI subscales and course delivery is non-existent.

Secondary Research Question

Relationship between technology comfort and use, and academic performance, and self-regulation. The final focus of this study was to investigate the relationship between comfort with computers, the Internet, and Blackboard, and frequency of use of Blackboard, academic performance (i.e., estimated GPA, grade you would give yourself, and language development quiz), and self-regulation (i.e., total SRLI scores and SRLI subscales). Examining this relationship using Pearson r correlations demonstrated very few significant correlations. The first significant correlation included a positive moderate correlation with comfort level of Blackboard and grade you would give yourself with students in the face-to-face classes ($r = .56, p < .05$). Similarly, with students in the face-

to-face courses, a positive moderate correlation existed with the frequency of Blackboard use and total SRLI score ($r = .41, p < .05$). Examining the relationships for students receiving instructional objectives, two significant weak correlations resulted. First, a weak positive and significant correlation occurred between Blackboard comfort level and grade you would give yourself with students who received the well-written instructional objectives ($r = .35, p < .05$). For students who received the poorly-written instructional objectives, a weak positive and significant correlation resulted between frequency of Blackboard use and grade you would give yourself ($r = .34, p < .05$). In the above three of the four significant correlations, the outcome variable of grade you would give yourself was positively correlated with Blackboard comfort level and frequency of Blackboard use which was dependent on course delivery or instructional objectives.

Research demonstrating support for the above findings are reported below; however, they do not consider course delivery or instructional objectives since no studies exist in this area. Davies and Graff (2005) reported that a majority of 1st year students enrolled in a business program with more frequent use of Blackboard had performed better academically, specifically on their final grades. Another study with a less direct relationship to the above correlations, suggested that students who used Blackboard frequently to take online quizzes often had increased academic performance (Genevieve, 2006). Hrastinski (2008) presented a literature review supporting that increased online participation increased academic performance which corroborated the above findings. Song, Singleton, Hill, and Koh (2004) corroborated the above results that graduate students in instructional technology reported increased comfort with online technology such as Blackboard was a factor that lead to success in the course. Finally, the remaining

positive correlation between frequency of Blackboard use and self-regulation (i.e., total SRLI score) is supported by Fisher and Baird (2005). Their study reveals that graduate students who are self-regulated tend to actively participate.

Correlations on Self-Regulation Learning Inventory subscales. Additional Pearson r correlations were conducted between the SRLI subscales, comfort with computers, the Internet, and Blackboard, and frequency of use of Blackboard. Again, only a handful of the Pearson r correlations resulted in significance. First, two moderately positive and significant Pearson r correlations occurred with students in the face-to-face classes: (a) between frequency of Blackboard use and SRLI executive processing subscale ($r = .44, p < .05$) and (b) frequency of Blackboard use and SRLI environmental utilization/control ($r = .52, p < .05$). In addition, when examining SRLI subscales and instructional objectives two significant Pearson r correlations resulted. First, a moderately positive and significant correlation occurred between frequency of Blackboard use and SRLI executive processing for students receiving the well-written instructional objectives ($r = .41, p < .05$). Second, a weak positive and significant correlation occurred between frequency of Blackboard use and SRLI cognitive processing for students receiving the well-written instructional objectives ($r = .35, p < .05$). Again, online participation or frequency of Blackboard use between SRLI subscales produced four significant correlations which were dependent on course delivery and instructional objectives. Two of the four significant correlations occurred with SRLI executive processing subscale. The other two significant correlations occurred with SRLI cognitive processing and SRLI environmental utilization/control subscales. Research examining the relationship between SRLI and the above variables is nonexistent.

Mediating Effects

A lesser focus of this study was to determine the relationship between course delivery and academic performance variables while controlling for self-regulation (i.e., total SRLI). Results examining this relationship indicated no significant relationships.

Limitations of the Study

In this study, several limitations will be discussed that could otherwise explain the results of the study. Among the limitations to be discussed are issues with research methodology and design which include using a post-test only design, sampling, contamination, assigning students to course delivery conditions, and amount of time given to students to complete and return their measures. Similarly, the absence of qualitative methods and analysis presented additional limitations. Other limitations occurred with course design which included the lecture content, selection of the digital video, and online course activities. Limitations were also presented in the selection and development of outcome measures and categorization of instructional objectives. Finally, instructor and student characteristics were limitations such as reading and comprehension of instructional objectives among students and personality characteristics among students (e.g., motivation) and instructors.

Methodology and Design

First, the research design chosen for this study was a quasi-experimental four-group post-test only design using a convenience sample. Cook and Campbell (1979) have highlighted the limitations of their design such as the absence of pre-test measures, a control group, and randomization. Since pre-test measures were not used in this study, it is difficult to determine if a difference occurred in the outcome variables. For instance, if

students were administered the SRLI before and after they participated in the class, it could be determined whether the SRLI scores increased, decreased, or neither in the four class conditions. Instead, this study can only conclude whether there was a comparable difference between the four conditions at post-intervention. In addition, the use of pre-test scores allows an analysis on whether the four groups in the experiment would have been equivalent on the outcome measures if they all had very similar pre-test scores. Another drawback of this chosen design was the absence of a control group. Without a control group, it is uncertain whether the two independent variables produced any effect on the outcome variables or whether it was due to students participating in the study. Also, a random sample was not used in this study. Given this, the convenience sample used may not be representative of the population, therefore making it difficult to generalize the results. Another limitation concerning design issues was controlling for contamination. Students in each class were never asked to maintain confidentiality pertaining to the activities of the study. Therefore, there was no way to assess the effects of the results if students discussed the study among themselves and across classes. Finally, the study only used four course sections on lifespan development which limited the course content, and therefore, the ability to generalize beyond the scope of lifespan development course content. In addition, the study could have benefited from using more lifespan development course sections and other courses which would ultimately increase the sample size and statistical power.

The number of subjects participating in this study only marginally meet the criteria for statistical power except for the course delivery condition. Other issues with sampling included a majority of the students who were from a large urban university,

predominately white, female, young (mean age = 19.89) and lower undergraduate classmen. With this limitation, the results of this study will be difficult to generalize beyond this sample. In addition, fewer students participated in the face-to-face classes than the online classes. Perhaps the small number of students in the face-to-face was a self-selection of higher achieving students hence the higher academic performance and self-regulation mean scores compared to the online students in this study.

Although students in both courses were encouraged to complete and return the measures as soon as possible, ample time to return the measures was allotted. Perhaps the scores on their outcome measures were affected by the amount of time given for students to complete their measures. The length of time between the language development lecture and completing the measures, particularly the language development quiz, could result in poorer scores on the language development quiz. Cognitive research has demonstrated that students are more likely to remember information more immediately than delayed (Ebbinghaus, 1885/1912; Peterson & Peterson, 1959). Issues with assigning students to course delivery conditions presented some limitations. Two of the course instructor's students were assigned to two of the four classes with the same course delivery. In particular, one course instructor's (instructor A) students were assigned to the two online classes while the other course instructor's (instructor B) students were assigned to the two face-to-face classes. With such an arrangement, it increases the difficulty to attribute the results to course delivery or instructor characteristic(s) (e.g., personality characteristic or teaching approach/method).

Method of Analysis

In this study, the method of analysis was quantitative. To gather more information to support the findings and possibly answer this study's research questions, employing qualitative methods such as a focus group could have corroborated the results or possibly provided evidence to support the hypothesis. In particular, qualitative methods could have been employed to collect more information from students to assess course delivery and quality of instructional objectives affected their self-regulation skills and academic performance skills.

Course Design

The researcher based the language development class lecture content on the textbook used in the existing courses and his own experience without the two course instructors reviewing it. Since the lecture content was not reviewed by the instructors or any faculty members, it is difficult to assess the quality of the lecture which may have influenced the outcome measures such as the language development quiz.

In addition, selecting one of the two digital video recordings of the language development class lecture from the two face-to-face classes for the two online classes presented another limitation. Specifically, this selection resulted in students being assigned to one of the face-to-face classes participating in a slightly varied class lecture since the three class lectures would be identical. As a result, selection of the video could have affected the results of the study since one of the face-to-face class lectures was not exactly the same as the other three class lectures (online or face-to-face).

Another factor that could have limited the study is the online activities students choose to use in this study. While research has shown that discussion boards are one of the most frequently used online teaching tool, many of the students in the online classes

in this study did not use the discussion board. As a result, this may have confounded the results of this study since online students in this study may have not been similar to how students use online activities compared to other online students.

Categorization of Instructional Objectives

Another limitation of the study is the selection of Temple faculty experts who reviewed and categorized the instructional objectives as well or poorly written. First, only three Temple University faculty experts reviewed and categorized a list of instructional objectives on language development based on their experiences in teaching certain courses. It is unclear whether the selected Temple faculty members were experts in writing instructional objectives, particularly in writing instructional objectives for a lifespan development course on language development. In fact, not all of the three faculty experts were selected from Temple's School of Education and may have never taught a class lecture on language development. With only three experts reviewing and categorizing the instructional objectives as poorly or well-written, it is difficult to determine whether the categorized instructional objectives could represent how a population of faculty experts would categorize instructional objectives. Perhaps, a larger group of experts selected from higher educational institutions teaching undergraduate language development classes would increase the likelihood of categorizing the instructional objectives similar to the population of experts on writing instructional objectives.

Selection and Development of Outcome Measures

Moreover, several limitations were presented concerning the outcome measures. For instance, two of the three academic performance measures were estimations based on

students' self-perceptions of their own academic performance: estimated GPA and grade you would give yourself. Since these measures were not actual measures, it is difficult to determine the accuracy of these self-perception measures related to the students' actual grades. Consequently, these measures may not be accurate and potentially confounded the results.

Another outcome measure that could have confounded the results was the language development quiz which was created by the researcher. As explained earlier, the development of the language development quiz based the content from the lifespan development course textbook. Even though the two assigned instructors of the course reviewed the language development quiz and provided feedback, perhaps using other instructors and faculty who have taught this course to review the quiz would have created a more reflective quiz of language development. Consequently, it is difficult to determine how the language development quiz affected the results of this study.

Reading and Comprehension of Instructional Objectives

It is unclear whether students read and successfully comprehended the instructional objectives even if course instructors and researchers observed students' behaviors in the face-to-face classes. It is more difficult to determine whether students in the online classes read and comprehended the instructional objectives since instructors and the researcher could not observe their behavior. However, attempts to determine whether students in all classes read the instructional objectives were self-reported on students' responses to the Quality of Instructional Objectives Questionnaire (QIOQ) in this study. The two specific questions included on the QIOQ on reading and comprehension were a) "I read all the instructional objectives" and b) "I thought that the

instructional objectives were easily understood”. The results of these two questions indicated that over 80% of the students “strongly” to “somewhat” agreed that they read and understood the instructional objectives. While the results indicated that a majority of students read and comprehended the instructional objectives, the construction of the instructional objectives never considered a review to evaluate the comprehension or readability by students or faculty. Such a review may have resulted in more students having a greater likelihood of comprehending the instructional objectives.

Student and Instructional Factors

The course design for online and face-to-face classes presented issues which lead to another possible limitation. Since this study was voluntary, it did not require but asked students to complete the online activities such as participating in discussion boards, viewing the digital language development video, or reading the lecture notes. In an undergraduate class, online or face-to-face students are evaluated on a number of activities which contribute to an overall class evaluation expressed in a letter grade. This letter grade can function as a motivating factor which was not present for classes used in this study. With this being the case, an assumption can be made that some of students who participated in this study did not complete the class activities to their potential since there were no motivational or consequential factors such as a grade. While a letter grade functions as an external motivating factor, the researcher is unsure of the student’s intrinsic motivational levels related to the outcome of this study. In addition, the SRLI subscale has a motivation scale which demonstrated that students in this study fell within $\frac{1}{2}$ a standard deviation to the means on the SRLI motivation scores reported in the Lindner, Harris, and Gordon (1996) study. Another outcome of their study was that the

SRLI motivation subscale positively correlated moderately with students GPAs at a significant level.

Finally, another limitation was present for students who had one of the two instructors. While all four classes in the study were taught by the researcher, students who had instructor A or B could have impacted the results because of a number of instructor characteristics (e.g., teaching style and personality). In fact, the results demonstrate that students who had the instructor teaching students in the face-to-face classes performed better on almost all of the academic performance measures and the total and subscale self-regulation measures. As mentioned before, the results of the study could have been influenced by the personality of the instructors and/or their teaching methods.

Directions for Future Research

This study is the first to examine the relationship between the quality of instructional objectives and course delivery simultaneously as it affects academic performance and self-regulation. In the section above, several limitations were presented in this study. In this section, suggestions for future research to address these limitations will be explored below.

Methodology and Design

First, future research may want to consider an alternative research design to the quasi-experimental post-test design used in this study. One suggestion is to use a different quasi-experimental design such as a non-equivalent control group design with pre-test and post-test as proposed by Cook and Campbell (1979) to address the limitations discussed in the previous section (e.g., equivalent groups, control group). Although it is

virtually impossible to use a class that is a random sample of students, future researchers should attempt to recruit a large sample of undergraduate students. Once recruited, this large sample of students can be randomly assigned to an instructional task or a single class lecture to ensure representation of the population. Controlling contamination may also be impossible, however, communicating to students that several aspects of the study will be kept confidential may help reduce any of the effects it may have on the outcome variables.

In this study, the sample mainly consisted of young white females who were undergraduate underclassmen from a large urban university. Future studies may want to expand on the sample such as males, older students, and other minority groups to generalize the results to the population better. Furthermore, future studies may want to increase the sample size in order to increase the power of the study which would reduce the likelihood of incurring a Type II error. Thirdly, the current study had more students participating in the online classes than the face-to-face classes. Future studies may want to ensure that a similar number of students be assigned to each condition. Consequently, an increase in sample size with similar number of students assigned to each condition will most likely prevent nonequivalent groups (e.g., one group may be more motivated, intelligent, and self-determined than another). Another student assignment issue for future research is to assign students to both course delivery conditions to control for any of the instructor effects. In the current study, one course instructor's students were assigned only to the face-to-face classes the other course instructor's students were assigned to the online course condition. In the future, assigning one course instructor's students to both course delivery conditions (online or face-to-face) would increase the

likelihood that the outcomes of study could be explained by course delivery or instructional objectives rather than instructor characteristics. Finally, as another issue to address the design of the study, future research may want to limit the amount of time students are allowed to complete and return the measures particular after a lecture where a quiz will follow. Requiring students to complete the measures immediately after the language development lecture, particularly the language development quiz, will reduce the likelihood that the results can be explained by cognitive processes related to memory.

Method of Analysis

Another area for further investigation is to employ qualitative methods such as interviews or focus groups. For instance, researchers can ask questions of undergraduate students on whether instructional objectives and course delivery affected their academic performance and self-regulation.

Course Design

Another consideration for future research is course design issues that were raised in the limitations section. First, future researchers may want to recruit experienced and more knowledgeable instructors in the area of language development to review the course content rather than relying on less experienced instructors and the textbook for the language development content. As a result, the language development lectures ensure content validity. Moreover, researchers may want to control which online activities students could access via Blackboard. Presenting many online activities in Blackboard as this study did, may not be common online course delivery practice. Unlike this study, if online activities are limited, researchers can attribute which online activity may have affected the results of the study. For instance, using only discussion boards to deliver the

online course content may allow researchers to determine the extent that discussion boards had an affect on the outcomes.

Development and Categorization of Instructional Objectives

Other suggestions for future research address the development and categorization of instructional objectives. In developing instructional objectives, future researchers may want to recruit more faculty members who are familiar with writing instructional objectives and have taught courses in life span development on language development. In addition, instead of the researcher drafting instructional objectives based on suggestions from the literature and his own teaching experiences, future researchers may want to recruit faculty to write both poorly and well-written instructional objectives. Another suggestion is to review course syllabi that address course objectives on language development and provide that list to a large number of faculty members who have taught the course to categorize those instructional objectives as well-written or poorly-written.

Selection of Outcome Measures

Similarly, researchers may want to obtain students' actual academic performance measures than use self-perception academic performance measures used in this study. It may be difficult to obtain actual measures such as GPA or course grade. However, in the future, researchers may want to obtain these measures instead of students' estimations of their GPA or self-perceptions of their grade.

Student and Instructional Factors

Finally, future research may want to address issues surrounding student and instructor characteristics and whether students read and comprehended the instructional objectives. Perhaps, matching instructors on similar teaching styles and students on

similar learning styles or even using a similar classmen (freshman) would address this limitation. In doing so, this suggestion would reduce the likelihood that the results could be due to an instructor characteristic or student characteristic. In addition, future researchers may want to directly ask students that they have read and understood the instructional objectives. Perhaps, future studies may want administer a quiz to students to assess whether they read and understood the instructional objectives.

Implications

In this study, instructional objectives did not have a significant effect on academic performance or self-regulation among undergraduate students. Perhaps this finding is more attributed to undergraduate students not reading or applying the instructional objectives. If this is how undergraduate students relate to instructional objectives in their courses then institutions may want to revisit the purpose of using instructional objectives as they relate to course accountability and above all to undergraduate student learning. Also, if students do not perceive instructional objectives as very important, especially to their learning, then again the purpose of using instructional objectives should be revisited. In terms of self-regulation, if undergraduate students are not using instructional objectives, an assumption can be made that undergraduate students develop their own evaluative standards to successfully self-regulate. If this process is occurring, perhaps research should investigate how undergraduate students' self-evaluative process can be used in conjunction with instructional course objectives.

The effects of course delivery on academic performance did show a significant effect for both face-to-face and online learning depending on the outcome measure. The research seems to indicate that both delivery methods are equally effective. Perhaps

research should focus on comparing instructional practices that are similar to each other or those that are distinct to a delivery method and improve upon those instructional practices. For instance, written feedback given to undergraduate students is often used in both course delivery formats. Perhaps improving on written feedback rather than determining which course delivery method increases undergraduate students' class performance may be more important to further research.

Finally, in this study, comfort with technology had less of an effect on the outcome measures. This may be unique to this study given the sample used and their prior exposure to Blackboard. Again, the emphasis may be less on technology and more on improving specific instructional practices.

Overall, institutions of higher education may want to revisit the purpose of instructional objectives given that students may not be reading or using them to benefit their learning. Moreover, instructional objectives seem to be of small or no value to students in relation to self-regulation since students seem to self-regulate successfully without referring to instructional objectives. In addition, perhaps focusing less on determining which course delivery method is better and on improving on distinct instructional practices may be more beneficial to students' learning and how they academically self-regulate. Finally, comfort with technology seems to be less of a factor that influences academic performance and self-regulation given the results of this study.

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APPENDIX A

TABLES A.1 and A.2

Table A.1. *Pearson r Correlations on Demographic Variables between Academic and Self-regulation Variables*

	Est. GPA	Grade you would give yourself	Total SRLI	Language development quiz
Demographic variables				
Age	.073 (.537)	.202 (.083)	.132 (.300)	.033 (.780)
Gender	.295* (.011)	.103 (.378)	.235 (.059)	.107 (.356)
Ethnicity	-.173 (.140)	.094 (.418)	.025 (.843)	-.162 (.163)

Note. Values enclosed in parenthesis represent significance level, Asterisks denote $p < .05$, “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400, Gender Coding Male=1, Female=2; Ethnicity Coding White=1, Hispanic=2, African-American=3, Asian=4, Other=5

Table A.2. *Pearson r Correlations on Comfort and Blackboard Use between Academic and Self-regulation Variables*

	Est. GPA	Grade you would give yourself	Total SRLI	Language development quiz
Comfort variables				
Computer	-.103 (.384)	-.036 (.755)	-.127 (.313)	.033 (.776)
Internet	-.055 (.640)	.123 (.288)	-.063 (.618)	-.005 (.966)
Blackboard	-.074 (.532)	.235* (.041)	-.051 (.689)	-.076 (.515)
Blackboard use	.069 (.557)	-.224 (.052)	-.234 (.061)	.053 (.648)

Note. Values enclosed in parenthesis represent significance level, Asterisks denote $p < .05$, “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400, Comfort Variables Coding 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

APPENDIX B

TABLES B.1 and B.2

Table B.1. *Pearson r Correlations on Computer, Internet, Blackboard Comfort level and Blackboard use between Academic Performance Variables and Total SRLI across Course Delivery*

	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Computer comfort level				
Face-to-face	.03	.11	.00	-.04
Online	-.15	-.09	.03	-.17
Internet comfort level				
Face-to-Face	-.09	.20	-.27	.08
Online	-.04	.09	.11	-.13
Blackboard comfort level				
Face-to-Face	.12	.56*	-.05	.12
Online	-.15	.07	-.10	.01
Frequency of Blackboard use				
Face-to-Face	.11	-.19	-.20	.41*
Online	-.04	.22	-.13	.16

Note. Asterisks indicates $p < .05$, “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400, Comfort Variables Coding, 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

Table B.2. *Pearson r Correlations on Computer, Internet, Blackboard Comfort Level and Blackboard Use between Academic Performance Variables and Total SRLI across the Quality of Instructional Objectives*

	Est. GPA	Grade you would give yourself	Language development quiz	Total SRLI
Computer comfort level				
Poorly written	-.24	.01	-.15	-.03
Well written	.04	-.09	.16	-.20
Internet comfort level				
Poorly written	-.27	.20	-.21	-.02
Well written	.13	.07	.14	-.06
Blackboard comfort level				
Poorly written	-.13	.08	.04	.06
Well written	.02	.35*	-.18	.08
Frequency of Blackboard use				
Poorly written	-.03	.34*	-.04	.16
Well written	-.18	.10	-.07	.31

Note. Asterisks indicates $p < .05$, “Estimated GPA” ranges from 0 to 4, “Grade you would give yourself” ranges from 1 to 10 (1 denotes a grade of “F” and 10 denotes a grade of “A”), “Language development quiz” scores ranges from 0 to 10 (total possible score is 10), “Total SRLI” (Self-regulation learning inventory) ranges from 0 to 400, Comfort Variables Coding 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

APPENDIX C
TABLES C.1 to C.4

Table C.1. *Pearson r Correlations on Computer, Internet, and Blackboard Comfort Level between SRLI Subscales across Course Delivery*

	SRLI executive processing	SRLI cognitive processing	SRLI motivation	SRLI environmental utilization control
Computer comfort level				
Face-to-Face	.12	-.16	-.24	.18
Online	.15	-.21	.09	-.18
Internet comfort level				
Face-to-Face	.21	.00	-.15	.22
Online	.06	.14	.00	-.26
Blackboard comfort level				
Face-to-Face	-.04	.14	.03	.25
Online	-.22	.18	.11	-.06

*Indicates significance at $p < .05$ Each SRLI subscale (Self-regulation learning inventory) ranges from 0 to 100, Comfort Variables Coding, 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

Table C.2. *Pearson r Correlations on Blackboard Use between SRLI Subscales across Course Delivery*

	SRLI executive processing	SRLI cognitive processing	SRLI motivation	SRLI environmental utilization control
Frequency of Blackboard use				
Face-to-Face	.44*	.32	.09	.52*
Online	.20	.19	.27	.09

*Indicates significance at $p < .05$ Each SRLI subscale (Self-regulation learning inventory) ranges from 0 to 100, Comfort Variables Coding, 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

Table C.3. *Pearson r Correlations on Computer, Internet, and Blackboard Comfort Level between SRLI Subscales across Instructional Objectives*

	SRLI executive processing	SRLI cognitive processing	SRLI motivation	SRLI environmental utilization control
Computer comfort level				
Poorly written	.17	-.08	-.10	-.13
Well written	.16	.28	.06	-.02
Internet comfort level				
Poorly written	.20	.00	-.26	-.09
Well written	.04	.19	.08	-.17
Blackboard comfort level				
Poorly written	.18	.00	-.02	-.01
Well written	.13	.33	.19	.11

*Indicates significance at $p < .05$, *Indicates significance at $p < .05$ Each SRLI subscale (Self-regulation learning inventory) ranges from 0 to 100, Comfort Variables Coding, 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

Table C.4. *Pearson r Correlations on Blackboard Use between SRLI Subscales across Instructional Objectives*

	SRLI executive processing	SRLI cognitive processing	SRLI motivation	SRLI environmental utilization control
Frequency of Blackboard use				
Poorly written	.11	.12	.16	.09
Well written	.41*	.35*	.17	.31

*Indicates significance at $p < .05$, *Indicates significance at $p < .05$ Each SRLI subscale (Self-regulation learning inventory) ranges from 0 to 100, Comfort Variables Coding, 3=High Comfort Level, 2=Middle Comfort Level, 1=Low Comfort Level; Blackboard use Coding, 4=Always, 3=Sometimes, Rarely=2, 1=Never

APPENDIX D
MEASUREMENTS

Demographic Sheet with Coding

Background Information

Age: _____ (age)

Biological Gender (circle one): (gndr)

Male Female

1 2

Ethnicity (circle one): (ethn)

White Hispanic African-American Asian Other

1 2 3 4 5

Are you a (circle one): (clss)

Freshman Sophomore Junior Senior Other

1 2 3 4 5

Declared Major(s): _____ (dcmjr)

Desired Career: _____ (dscr)

Do you plan on attending graduate school in the future? (gradintent)

Yes No

1 2

Other questions

Estimated hours dedicated to this class per week: _____ Hours (hrsprwk)

Estimated/Known GPA: _____ GPA (estgpa)

If you were grading yourself in this class, what grade would you assign yourself (circle one)? (clsgrd)

A A- B+ B B- C+ C C- D F

10 9 8 7 6 5 4 3 2 1

Comfort questions**Please rate your comfort level with using a computer (circle one)? (cmptcmf_rcd)**

Very Comfortable Somewhat Comfortable Comfortable Somewhat Uncomfortable Very Uncomfortable

Coding

3=Very to Somewhat Comfortable=High Comfort

2=Comfortable=Mid Comfort

1=Somewhat to Uncomfortable=Low Comfort

Please rate your comfort level with using the Internet (circle one)? (intcmf_rcd)

Very Comfortable Somewhat Comfortable Comfortable Somewhat Uncomfortable Very Uncomfortable

Coding

3=Very to Somewhat Comfortable=High Comfort

2=Comfortable=Mid Comfort

1=Somewhat to Uncomfortable=Low Comfort

Have you ever used Blackboard? (blbuse)

Yes No

1 2

If yes to the above question, please rate your comfort level with using Blackboard (circle one)? (blbcmf_rcd)

Very Comfortable Somewhat Comfortable Comfortable Somewhat Uncomfortable Very Uncomfortable

Coding

3=Very to Somewhat Comfortable=High Comfort

2=Comfortable=Mid Comfort

1=Somewhat to Uncomfortable=Low Comfort

How often have you used Blackboard? (frqblb_rcd)

Always Sometimes Rarely Never

4 3 2 1

**Language Development
Multiple Choice Quiz
10 Questions**

Please circle the best answer.

1. Which of the following is considered one of the four components of language?

- A) Interactionist
- B) Pragmatics
- C) Empiricist
- D) Phonics

2. When a child makes a sound of “nanana”, this is referred to as:

- A) cooing
- B) babbling
- C) humming
- D) vocables

3. A 3-year-old child listens to several new words when a story is read. Immediately afterwards the child is able to use the words in other contexts. Which of the following concepts represents the child’s actions?

- A) Holophrasing
- B) Over-extension
- C) Under-extension
- D) Fast-mapping

4. A developmental psychologist believes that children ONLY learn language by rewarding and/or punishing a child for stating certain words or phrases. Which of the following language development perspectives would the researcher subscribe to?

- A) Interactionist
- B) Empiricist
- C) Nativist
- D) Pragmatics

5. A child is constantly adding “-ed” to every verb? Which of the following BEST describes this concept?

- A) Overregularization
- B) Over-extension
- C) Under-extension
- D) Underregularization

6. Which best describes the order of language development?

- A)Cooing, babbling, telegraphic speech
- B)Cooing, telegraphic speech, babbling
- C)Telegraphic speech, babbling, cooing
- D)Telegraphic speech, cooing, babbling

7. A child states the following throughout the day “Go doggie”, “Jump Timmy”, and “Where Daddy”. What is this referred to as?

- A)Fast-mapping
- B)Productive language
- C)Telegraphic speech
- D)Receptive language

8. A child states “CarCar goes” and the mother responds in a high pitched voice very slowly and states “Yes, the car is driving away”. What is this referred to as?

- A)Motherese
- B)Expansion
- C)Over-extension
- D)Under-extension

9. A particularly theorist believes that a child’s capacity to learn language is best before puberty. What is this referred to as?

- A)Critical period
- B)Sensitive period
- C)Germinal period
- D)Pre-linguistic period

10. The ability to think of language as a system is referred to as:

- A)Pragmatic Awareness
- B)Metalinguistic Awareness
- C)Critical Awareness
- D)Phonic Awareness

Quality of Instructional Objectives Questionnaire

Instructional Objectives are used by instructors to specify what will be learned in a class and/or the course. In other words, what the student should know or learn at the end of a class or course.

Directions: Please rate the statements below based on the instructional objectives that were handed out in class or were provided via Blackboard.

1. I read all the instructional objectives.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

2. I paid attention to the instructional objectives.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

3. I thought that the instructional objectives were easily understood.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

4. I thought that the instructional objectives provided clear expectations of what I should learn in this class.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

5. I thought that the instructional objectives were specific and not vague.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

6. I thought that the instructional objectives were helpful to my learning.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

7. I thought that the instructional objectives helped me focus on specific areas I should be learning.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

8. I thought that the instructional objectives helped me assess and evaluate my learning.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

9. I thought that the instructional objectives were relevant to the subject matter of the class.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

10. I could observe myself completing the instructional objectives.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

11. I thought that the instructional objectives for the class were accomplished.

Strongly Agree Somewhat Agree Neither Agree/Disagree Somewhat Disagree Strongly Disagree

APPENDIX E
INSTITUTIONAL REVIEW BOARD
APPROVAL LETTER



TEMPLE
UNIVERSITY

Office for Human Subjects Protections
Institutional Review Board
Medical Intervention Committees A1 & A2
Social and Behavioral Committee B

3400 North Broad Street
Philadelphia, Pennsylvania 19140
Phone: 215.707.3390 Fax: 215.707.8387
e-mail: richard.throm@temple.edu

Research Review Committee B

Certification of Approval for a Project Involving Human Subjects

Protocol Number: **11317**
 PI: **DUCETTE, JOSEPH**
 Approved On: 15-Oct-2007
 Review Date: 14-Jan-2008
 Committee: B BEHAVIORAL AND SOCIAL SCIENCES
 Department: PSYCH STUDIES IN EDUC (1904)
 Project Title: Effects of the Quality of Instructional Objectives on Metacognitive Factors of Academic Self-Regulation and Course Performance of Students Enrolled in Undergraduate Online and Non-Online Courses

In accordance with the policy of the Department of Health and Human Services on protection of human subjects in research, it is hereby certified that protocol number 11317, having received preliminary review and approval by the department of PSYCH STUDIES IN EDUC (1904) was subsequently reviewed by the Institutional Review Board in its present form and approved on 15-Oct-2007 with respect to the rights and welfare of the subjects involved; appropriateness and adequacy of the methods used to obtain informed consent; and risks to the individual and potential benefits of the project.

In conforming with the criteria set forth in the DHHS regulations for the protection of human research subjects, and in exercise of the power granted to the Committee, and subject to execution of the consent form(s), if required, and such other requirements as the Committee may have ordered, such orders, if any, being stated hereon or appended hereto.

It is understood that it is the investigator's responsibility to notify the Committee immediately of any untoward results of this study to permit review of the matter. In such case, the investigator should call Richard Throm at 707-8757.

ZEBULON KENDRICK, Ph.D.
CHAIRMAN, IRB



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MEMORANDUM

To: **DUCETTE, JOSEPH**
PSYCH STUDIES IN EDUC (1904)

From: Richard C. Throm
Institutional Review Board

Date: 14-Jan-2008

Re: Expedited Request Status for IRB Protocol:
11317: Effects of the Quality of Instructional Objectives on Metacognitive Factors of Academic Self-Regulation and Course Performance of Students Enrolled in Undergraduate Online and Non-Online Courses

This addendum is to be affixed to the IRB Approval Certificate

45 CFR 46 Protection of Human Subjects.

Expedited review is a type of review that can be conducted by the IRB Chair, other IRB members designated by the Chair, or a subcommittee of the IRB. A major criterion for research that can initially (initial review) reviewed through expedited process is that it must involve no more than minimal risk. The DHHS regulations and FDA regulations define minimal risk to mean that "the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in the daily life or during performance of routine physical or psychological examinations or tests."

This research protocol was reviewed under the following Expedited Review Category:

Expedited Category #7: Research on group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.