5-2015

The Impact of Academic and Teaching Self-Efficacy on Student Engagement and Academic Outcomes

Lesther A. Papa
Utah State University

THE IMPACT OF TEACHING AND ACADEMIC SELF-EFFICACY ON STUDENT ENGAGEMENT AND ACADEMIC OUTCOMES

by

Lesther A. Papa

A thesis submitted in partial fulfillment
of the requirements for the degree

of

EDUCATIONAL SPECIALIST

in

Psychology

Approved:

Melanie M. Domenech Rodríguez, Ph.D. Major Professor	Scott C. Bates, Ph.D. Committee Member
Kerry E. Jordan, Ph.D. Committee Member	Mark R. McLellan, Ph.D. Vice President for Research and Dean of the School of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

2015

ABSTRACT

The Impact of Academic and Teaching Self-Efficacy on Student Engagement and Academic Outcomes

by

Lesther A. Papa, Educational Specialist

Utah State University, 2015

Major Professor: Melanie M. Domenech Rodríguez, Ph.D.
Department: Psychology

The present study examined the relationship between student academic self-efficacy, students' perceptions of their instructor's teaching self-efficacy (PIE), and student engagement and academic outcome (i.e., grades). Evidence shows academic self-efficacy (ASE) changes over time and may be predictive of students' academic outcome. Research shows a correlation between students' ASE, student engagement, and academic outcome. The directionality of the relationship between the three variables is less clear. Also unknown is what role the teaching self-efficacy (TSE) plays in student engagement. Research has shown that instructors have an effect on student engagement but no research has specifically linked TSE to student engagement. Three questions were explored: (1) Do changes in ASE predict student engagement and course grade in a different sample? (2) Does student engagement mediate or moderate the relationship between ASE and course grade? and (3) Does PIE affect the relationship between

students' ASE and student engagement? Results showed that changes in ASE positively predict both student engagement and course grade. Student engagement partially mediated that relationship between ASE and course grade but performance engagement fully mediates this relationship. However, PIE did not affect the relationship between ASE and student engagement. In fact, ASE did not significantly correlate with PIE. These findings are discussed for implications in the classroom.

(60 pages)

PUBLIC ABSTRACT

The Impact of Academic and Teaching Self-Efficacy on Student Engagement and Academic Outcomes

by

Lesther A. Papa, Educational Specialist

Utah State University, 2015

As college classrooms increase in size, the challenge of keeping students engaged in the course becomes a greater challenge. Instructors are burdened with the task of managing larger classrooms while maintaining high levels of student participation. Research has shown that students tend to hide and are less likely to participate in larger classrooms. Research has also shown that student participation is affected by fear of judgment from their peers and the instructor. However it is unclear whether this fear is tied to students' perceived ability or self-efficacy. In addition, it may be that students' perception of the instructor may affect their class participation. The present study attempted to disentangle how these factors work together to influence student engagement in the classroom.

The present study was conducted over the fall 2013 semester. Two hundred forty-four students were recruited from three introductory psychology courses. At the beginning of the semester, students were asked to report their perception of their academic ability (academic self-efficacy; ASE) and demographic information. During the

last week of instruction, students were asked to self-report their ASE, level of course engagement, and perceptions of the instructors teaching self-efficacy (PIE). After grades were posted, the final grades for each student were collected.

Three predictions were explored: (a) changes in ASE would predict students' course grade, (b) the relationship between student ASE and student grades would be mediated or moderated by student engagement, and (c) PIE would moderate the relationship between students' ASE and student engagement. Two of the predictions were supported. Changes in ASE did predict students' course grades such that increases in ASE predicted increases in grades as well. Student engagement partially explained the relationship between ASE and grades. Closer examination showed that performance (wanting good grades in the course) accounted for the relationship between ASE and course grades. The final prediction could not be evaluated because PIE was not related to ASE. However results show that PIE does significantly impact student engagement in the course.

This adds to previous literature and shows that *perceptions* of an instructor's teaching self-efficacy can influence how students engage in the course. These results also align with previous research that has shown that students with higher sense of ASE and course engagement have better academic outcomes.

ACKNOWLEDGMENTS

I would like to offer my thanks to those who helped me on my personal and professional journey towards completing my thesis. Thank you to Drs. Scott Bates and Kerry Jordan for their thoughtful insight and critical feedback. Your input helped refine the quality of the present work and develop me as a researcher. I would also like to thank the instructors, teaching assistants, and students who participated in the study. Without your assistance and responses this study would not have been possible. I am grateful to my research assistants, Derek Douglass, Micah Orton, and Jared Bice, for their respective contributions to each phase of the research process. Thank you for all your hard work and joining alongside me on this venture. Here is a shout out to all my cohort peeps who have provided me with loving support, laughs, a sense of family, and for witnessing the proposal of this project. Finally, I would like to give my deepest, heartfelt thanks to my advisor and mentor, Dr. Melanie Domenech Rodríguez. Thank you for all your loving encouragement, guidance, and wisdom. I am truly blessed to have a mentor who can help me grow as a researcher, clinician, teacher, and most of all, as a person. You have been there through the highs and lows of my grad school journey so far and I am glad that I can take comfort in knowing you will be there until the end of it.

I would like to make special acknowledgments to my family. Para sa aking mga magulang, maraming salamat po sa inyong pag-mamahal, suporta, at tiwala sa akin. Para sa aking kapatid, sana ay sundin din ninyo inyong mga hangarin sa buhay na katuald ko.

At ang pang huli sa aking lola Rosing, salamat po sa pag-aalaga mo sa akin. Gusto ko pong ipaalam sa inyo na mahal na mahal kayong lahat.

Lesther A. Papa

CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Across the nation, there tend to be more incoming first-year college students than ever in history (U.S. Department of Education, National Center for Education Statistics, 2012). The result is an increase in classroom size and a tendency to favor large lecture hall classes. While lectures have the advantage of teaching many students at once, little of the material becomes encoded in memory or is recorded in the students' notes (Hartley & Davies, 1978). In the traditional classroom setting, this creates a dual-edged problem. Instructors are forced to teach and manage larger classes while trying to keep students engaged as well. In larger lecture halls students seem more likely to hide in class and are less likely to participate (Karp & Yoels, 1976; Weaver & Qi, 2005). Still there will be the handful of students that make the effort to engage in discussions (Karp & Yoels, 1976; Weaver & Qi, 2005). This problem is not unique to traditional classrooms. Even in blended learning courses (combination of online and traditional instruction) students can be become less motivated to engage in a course because of reduced in-person interaction with the instructor and peers (Welker & Berardino, 2005-2006), technical difficulty (Sitzmann, Ely, Bell, & Bauer, 2010), and lack of skills needed to be successful for learning online (Stine, 2004; Welker & Berardino, 2005-2006).

Why do some students participate and some do not? Previous studies show that students have personal feelings of inadequacy in front of others and thus choose not to participate (Karp & Yoels, 1976; Weaver & Qi, 2005). These feelings of inadequacy were labeled as a lack of confidence in previous studies (Karp & Yoels, 1976; Weaver &

Qi, 2005) and may be due to the external influences of fear of peer disapproval and instructors' criticisms of their abilities (Weaver & Qi, 2005). However, what is less clear is if students' confidence is internally affected by how students' perceive their own abilities. Using Bandura's (1986) social-cognitive theory as a base, student's academic self-efficacy was measured in this study.

The construct of self-efficacy is fluid. Over the course of the semester, academic self-efficacy can change and these shifts predict exam performance and class participation at the end of class (Galyon, Blondin, Yaw, Nalls, & Williams, 2012). This change may be what accounts for better participation and exam scores. Thus, change in academic self-efficacy was measured to see if changes predicted student engagement and academic outcomes in a different sample.

Researchers revealed that positive academic outcomes are related to student engagement as well as academic self-efficacy (Bresó, Schaufeli, & Salanova, 2011; Choi, 2005; Galyon et al., 2012). However, there is not a clear indication of if these three variables are interrelated and if so, how. By using the model of self-efficacy provided for by social cognitive theory (Bandura, 1986, 1997), researchers can empirically examine (Baron & Kenny, 1986; MacKinnon, 2008) if student engagement mediates or moderates the relationship between academic self-efficacy and academic outcomes.

While students' internal (i.e., self-efficacy) and external (e.g., engagement) characteristics play a role in their academic outcomes, it is also critical to consider the role of the professor teaching any given course. Indeed, the influence of the teachers' behavior has been documented to affect student engagement (Rocca, 2010; Skinner &

Belmont, 1993). Student engagement tends to increase or decrease depending on the instructors' ability to incorporate student engagement in the classroom. A student then uses their perception of the instructors to judge whether or not they should engage in the material (Rocca, 2010; Skinner & Belmont, 1993). Historically, teacher's behavior has been studied through teacher self-report or observation. The present study made a unique contribution by also examining students' perceptions of teacher's efficacy. Specifically, the study examined if and how perceptions of an instructors teaching self-efficacy (TSE) affect the relationship between students' academic self-efficacy and student engagement.

Answering the questions posed in this research could lay a foundation for helping teachers and students overcome the challenges of engaging the material in larger classroom settings. First, if changes in academic self-efficacy can predict academic outcome, then monitoring of academic self-efficacy could alert instructors to intervene and help students engage in activities that would positively influence their perceptions of their academic ability. Second, if student engagement can explain the relationship between student academic self-efficacy and academic outcome then incorporating more activities and time to dedicate to engaging the material in and outside the classroom would greatly increase academic outcome and students' chance of success in the class. Lastly, if the student's perception of the instructor's TSE significantly increases or decreases their engagement, then there would be a rationale to provide didactic interventions for instructors could help them improve in key areas such as classroom management, engaging students, and instructional strategies.

CHAPTER II

LITERATURE REVIEW

Social Cognitive Theory

The theoretical framework for this study is Bandura's (1986) *social cognitive theory* (SCT). According to Bandura, behavior is an interaction of three factors: the person, their behavior, and their environment; this is known as *reciprocal determinism* (see Figure 1). The person factor addresses internal factors such as cognitive and personal factors. The behavior factor addresses the actions of the individual and the environment factor addresses the individual's setting, situation, and context.

For example, in the classroom (environment) a student (person) brings certain internal factors like preferences, experiences, and abilities. As a student, he or she can vary their course engagement (behavior) by opting to attend the class, listen to the

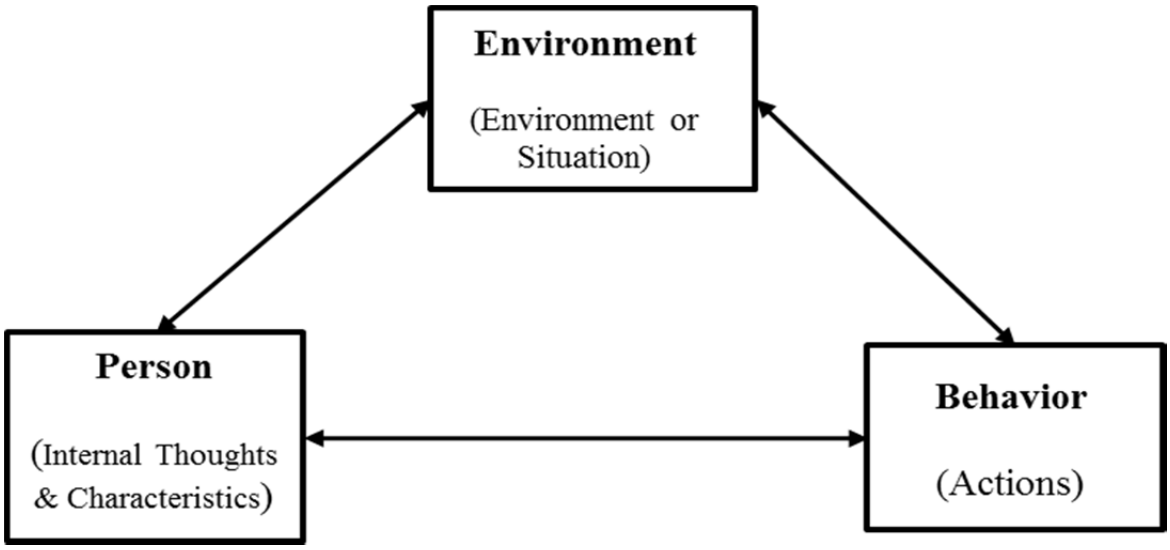

Figure 1. Schematic representation of reciprocal determinism.

lecture, and take notes. According to reciprocal determinism, the amount of student engagement is dictated by the environment of the classroom and the student's previous experiences of being in classrooms. In this case, environment and personal factors influence behavior. However, the student is also able to manipulate their environment by selecting which classes they want to attend based on their preferences and is able to select how much they want to engage in the class. Additionally, students' current course engagement is manipulated by their environment in terms of how the instructor designs the course and thus dictates in part how they are able to engage in the classroom (i.e., incorporating discussions and/or reaction papers). Hence, the three factors influence each other in a reciprocal fashion.

Bandura (1986) further explained that persons have five basic cognitive capabilities: symbolizing, forethought, vicarious, self-regulatory, and self-reflective. The *symbolizing capability* refers to a person's ability to use symbols to "process and transform transient experiences into internal models that serve as guides for future action" (p. 18). This capability allows persons to test solutions mentally rather than acting them out in a trial and error fashion. The *forethought capability* builds on the symbolizing capability to allow individuals to plan courses of action for themselves which results in self-directed behavior. The *vicarious capability* allows persons to learn by observing people's behavior and their consequences. In a classroom setting, students who watch other students be rewarded by the instructor in the form of verbal praise for class participation may be more inclined to participate themselves.

The latter two capabilities are crucial to understanding *self-efficacy*. The *self-*

regulatory capability means that people are able to motivate and regulate their own internal standards. In the classroom, this translates to how motivated students are to succeed following their own criterion of success. The *self-reflective capability* means that people have a metacognitive ability to analyze their own thought processes and gain knowledge about themselves and the world around them. Thus, students are able to examine their own abilities, learning, and their environment.

Self-Efficacy

The term used to describe a person's belief in his or her own ability to perform necessary tasks to achieve goals is *self-efficacy* (Bandura, 1997). Self-efficacy tends to be assessed for narrow (e.g., this course) as opposed to general tasks (e.g., general learning; Bandura, 1997). This study focused on student's self-efficacy, instructors' self-efficacy, and the students' outcomes in terms of student engagement, grades, and satisfaction.

Self-efficacy needs to be distinguished from *self-concept*. Self-efficacy refers to an evaluation of the self while self-concept refers to comparisons of one's self with others (Choi, 2005). In research on students' confidence, comparisons have been made in terms of how students feel about themselves in relation to others (i.e., peers and the instructor; Weaver & Qi, 2005). Student confidence in that sense dealt with the students' self-concept. The focus of this study was on students' self-efficacy (i.e., evaluations made of the students' own abilities).

Another difference between self-efficacy and self-concept is the level of specificity involved for each construct. Self-concept tends to be more broad, (e.g.,

learning statistics) and self-efficacy tends to be more specific (e.g., computing a standard deviation). Bandura (1997) explained that one reason studies do not observe a significant effect between a self-efficacy construct and their dependent measure is because the level of self-efficacy measured and the criterion behavior did not closely align (i.e., there was not appropriate specificity in measurement). Choi's (2005) work supported this explanation and found that course-specific ($r = .32$, $p < .01$) and academic self-efficacy ($r = .22$, $p < .01$) correlated more highly with term grades than general self-efficacy ($r = .14$, $p > .01$). For this study academic self-efficacy was used as a predictor variable because it was considered to be most useful across different disciplines in a college setting.

Academic Self-Efficacy

High sense of academic self-efficacy has been defined by Bandura (1997) as fostering a high level of motivation, academic accomplishments, and developing intrinsic interest in academic subject matter. The self-regulatory capability of SCT helps account for skills that students should encompass such as: "planning, organizing, and managing instructional activities; enlisting resources; regulating one's own motivation; and applying metacognitive skills to evaluate the adequacy of one's knowledge and strategies" (p. 175).

Choi's (2005) research on academic self-efficacy (ASE) showed that course specific abilities (Wood & Locke, 1987) are a better measure of academic-self efficacy than a general self-efficacy measure. Owen and Froman's (1988) measure of academic self-efficacy that was also used in Choi's study was a better measure of academic self-efficacy because it adhered to Bandura's (2006) recommendations for creating a self-

efficacy measure and would equally compare the same abilities in all students; the measure has the added benefit of measuring a larger array of specific skills. Examples of the abilities include: writing a high-quality term paper, earning good marks in most courses, and understanding most ideas presented in class.

Academic Self-Efficacy and Academic Outcomes

Previous literature has found moderate relationships between ASE and academic outcomes. Choi (2005) found a moderate correlation of ASE with term grades ($r = .22$, $p < .01$) but a stronger correlation with the course specific measure (Wood & Locke, 1987; $r = .32$, $p < .01$) and found that course specific ASE was the only significant predictor of term grades when general, academic, and specific self-efficacy were entered into a regression model. Galyon and colleagues (2012) found similar results and found significant that ASE was modestly correlated with exam performance ($r = .19$, $p < .05$) and class participation ($r = .20$, $p < .05$). Further analysis by Galyon and colleagues also revealed that students with high GPA (3.53 and higher) had ASE scores that correlated with their participation ($r = .45$, $p < .01$) and with their exam score ($r = .28$, $p < .05$).

While these results showed that course ASE was significantly correlated with exam performance, term grades, and participation, the researchers also presented other noteworthy concerns. Choi (2005) entered general self-efficacy, academic self-efficacy, and course-specific self-efficacy into a regression equation and by doing so may have lowered the amount of the variance accounted for by just course-specific or academic self-efficacy. Thus the true predictive power of academic self-efficacy is unclear. Galyon

and colleagues (2012) came to the conclusion that self-efficacy's potential as a useful predictor is limited due to the weak to moderate strength of their findings. To address these issues, the academic self-efficacy measure by Owen and Froman (1988) was used to measure academic self-efficacy and capture a wider range of academic abilities. A subset of these abilities was tested to examine the effect of course-specific abilities.

Choi (2005) mentioned using four general education classes while Galyon and colleagues (2012) used three sections of an educational psychology class to include in their studies. Both studies used measures that were course specific. Choi failed to mention what these specific classes were while Galyon and colleagues used classes that were all the same subject. In this case, both studies failed to address possible between course differences in terms of the students perceived self-efficacy. The present study addressed these concerns by recruiting a single class of many students.

Galyon and colleagues (2012) measured exam performance via five exam scores and were able to detect changing relationships between ASE and exam performance over the course of one semester. Thus it seems that ASE tends to naturally change over time. Galyon and colleagues found that self-efficacy correlated positively with exam performance ($r = .19$, $p < .05$) by the end of the semester. Bresó and colleagues (2011) found different results. Student ASE was measured once and again 6 months later. In their comparison groups (stressed and healthy) no significant change was found in their ASE. However in their stress-reduction treatment group, students reported higher ASE and student engagement.

Teaching Self-Efficacy

TSE is defined by Bandura (1993) as beliefs teachers possess in their collective capabilities to influence the lives of their students. Klassen, Tze, Betts, and Gordon (2011) reviewed issues with TSE within the research. A few of the areas that the authors argued needed continued improvement included: finding the sources of teacher efficacy, creating a strong connection between teacher efficacy and student outcome, and the relevance of teacher efficacy research to educational practice.

The authors also identified measurement issues of TSE. The first self-report measure of TSE created by Gibson and Dembo (1984) was conceptually flawed in that it did not adhere to the domain specificity required to measure self-efficacy (Bandura, 1997, 2006). Tschannen-Moran and Woolfolk Hoy (2001) presented a new self-report measure that addressed these issues and made sure to adhere to Bandura's (1986, 1997, 2006) conceptualization and guidelines of creating self-efficacy measures. Tschannen-Moran and Woolfolk Hoy's measure included three factors that examined efficacy in: student engagement, instructional strategies, and classroom management. Thus, an instructor with high TSE would have great ability in engaging students with the material, pedagogical practice, and control of the classroom environment, which aligns well with Bandura's (1993) definition.

Student Engagement

Student engagement is a different type of outcome variable due to the fact that it reflects a process instead of an outcome (e.g., grades; Galyon et al., 2012). Student

engagement is comprised of four different factors: skills, emotional, participation/ interaction, and performance (Handelsman, Briggs, Sullivan, & Towler, 2005). The *skill engagement factor* focuses heavily on students practicing their skills such as taking notes, attendance, and completing assignments. The *emotional engagement factor* consists of intrinsic involvement in classes like desire to learn the material, applying the material to one's life, and finding ways to make the class more interesting. The *participation/ interaction factor* examines behavioral engagement with the material like raising your hand in class, asking questions, and engaging in class discussions. The *performance engagement factor* focuses on extrinsic motivation like getting good grades and doing well on tests. Thus, these factors seem to relate to academic self-efficacy because they tend to reflect the engagement ability of the students to their respective courses. Previous research has also shown good outcomes for each of these factors.

Gurung, Daniel, and Landrum (2012) found that students' use of skill engagement such as taking notes, reading the text, and using pedagogical aids to test knowledge correlated positively with their quiz performance. Research by Daniels and colleagues (2009) and Skinner, Wellborn, and Connell (1990) revealed that affective components (e.g., desire to learn and enjoyment) of student engagement are related to better outcomes. Daniels and colleagues also found that students with performance goals tend to positively predict academic achievement.

Studies show that if students are prepared and participate in class, students are more motivated, learn better, become better critical thinkers, and have self-reported gains in character (Rocca, 2010). Handelsman and colleagues (2005) found that as student

engagement increases so do grades. Class participation has been related to higher levels of thinking, including interpretation, analysis, and synthesis (Smith, 1977). This deeper processing has also been shown to be predictive of increased self-reported learning and student engagement in general seems predictive of quiz scores as well as self-reported learning (Gurung et al., 2012).

Despite the desirable outcomes, student engagement does not happen regularly. Early research by Karp and Yoels (1976) found that few students participated regularly in any given classroom. These findings have been confirmed in later studies (Rocca, 2010). Nunn (1996) observed in classrooms of an average of 30 students that only one minute of a 40-minute class was spent in student participation. Howard and Henney (1998) found that about 90% of interactions were made by a handful of students and only one-third were regular participators. Only half of the students observed participated at all. Students and instructors also differ on what they consider participation (Fritchner, 2000).

Student Perceptions of Instructor TSE as a Moderator

Research by Gurung and colleagues (2012), Rocca (2010), and Skinner and Belmont (1993), has shown that an instructor plays a part in how much a student engages with the material. Key factors include how much instructors allow and encourage student engagement (Karp & Yoels, 1976; Weaver & Qi, 2005). One of the key concepts for measuring TSE is that instructors show great ability in engaging students in the material and controlling the classroom environment (Handelsman et al., 2005). These variables will be linked into the reciprocal determinism model which focuses on the fact that

individuals' perception of their environment along with individuals' internal characteristics is what influences behavior. Thus, the students' perception of the instructors PIE may be what moderates the relationship between the students ASE and engagement with course material. In the present study, the individual equates to the student and their ASE, the environment equates to the students' PIE, and the behavior of interest equates to the student's engagement and outcomes (see Figure 2).

Student Engagement as Moderator or Mediator

Research reveals that positive academic outcomes are related to student engagement as well as academic self-efficacy (Bresó et al., 2011; Choi, 2005; Galyon et al., 2012). However, there is not a clear indication of if these three variables are interrelated and if so, how. According to Bandura (1986, 1997), a person's self-efficacy beliefs of a certain behavior will influence whether they perform that behavior and their outcome expectancy the person's belief on what outcome should be expected from

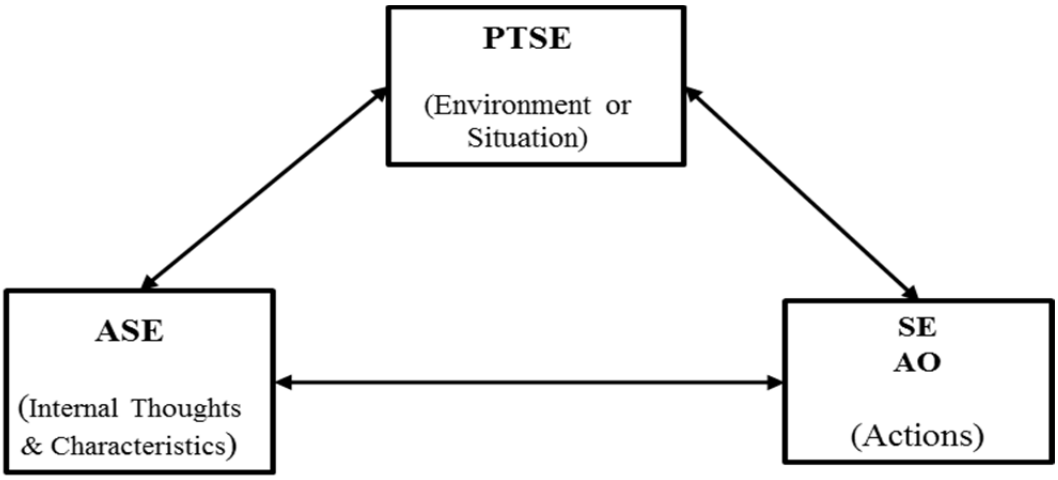

Figure 2. Reciprocal determinism schematic with study variables. ASE = academic self-efficacy; PIE = perception of instructor teaching self-efficacy; SE = student engagement; AO = academic outcome.

performing the behavior. By using this model in the study, it is predicted that students use their own ASE beliefs to determine whether or not to engage in the class and by engaging in the class they expect an outcome of a good grade (academic outcome). In this way, student engagement seems to be what mediates the relationship between ASE and academic outcomes. However, it is quite possible that there are students who do not readily engage the material and still have expectations of good academic outcomes. In this case, student engagement may instead moderate the relationship between ASE and academic outcome. Thus both a mediation and moderation analyses were needed to determine whether student engagement mediated or moderated the relationship between ASE and academic outcomes.

Study Overview

This study was built on past research and addressed past limitations. The current study was framed from one unified theoretical framework and used the reciprocal determinism and outcome expectancy models of SCT to evaluate the relationship between ASE, PTSE, student engagement, and academic outcomes. Three research questions were answered: (1) Does a change in ASE predict student engagement and academic outcomes? (2) Does student engagement mediate or moderate the relationship between ASE and academic outcomes? (3) Does PTSE moderate ASE and student engagement?

It was anticipated based on past literature that changes ASE will predict better outcomes for students in the positive direction but not for students in the negative

direction or those that do not change at all. It was also anticipated that student engagement will mediate or moderate the relationship between ASE and academic outcomes (see Figures 3 and 4). From the reciprocal determinism model it was predicted that PTSE will moderate the relationship between ASE and student engagement/academic outcomes (see Figure 5).

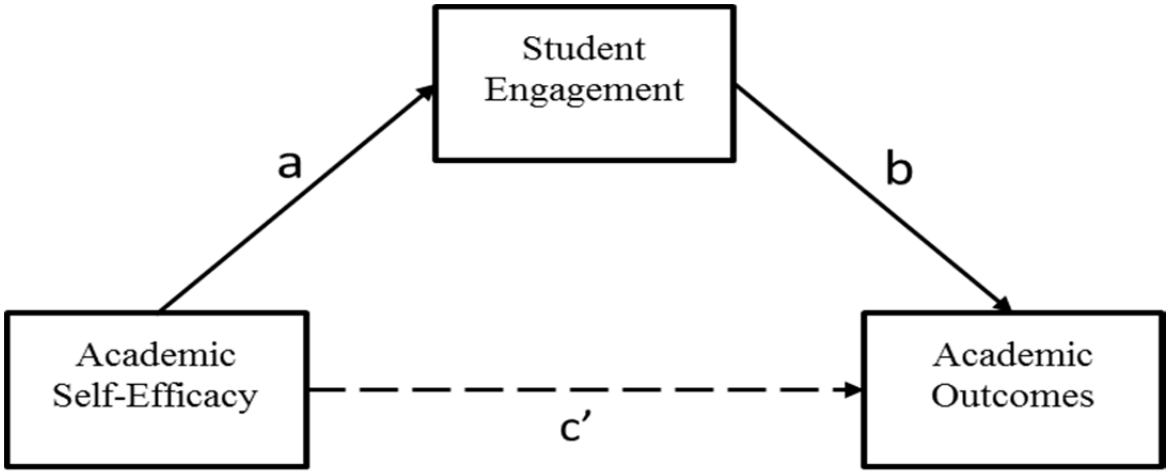

Figure 3. Proposed mediation pathway.

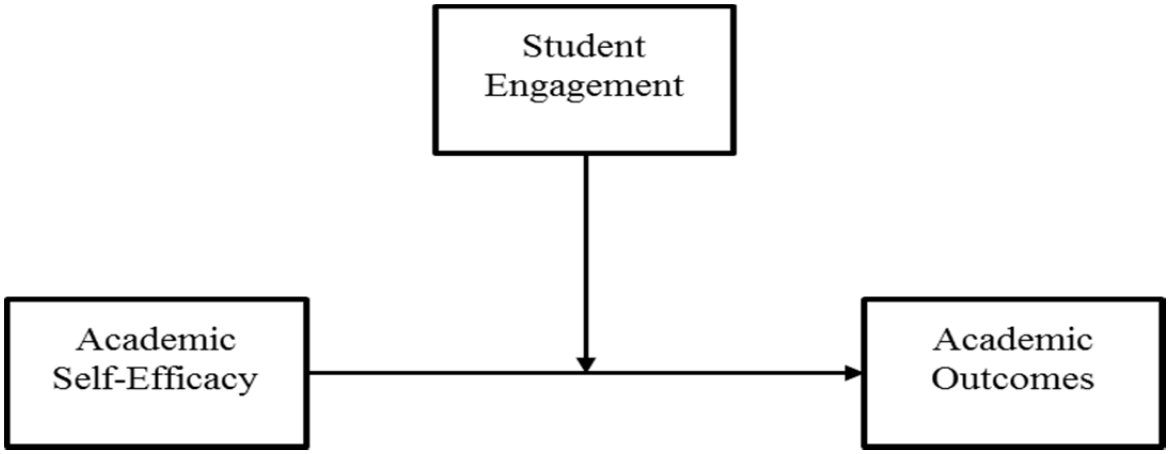

Figure 4. Proposed moderation pathway.

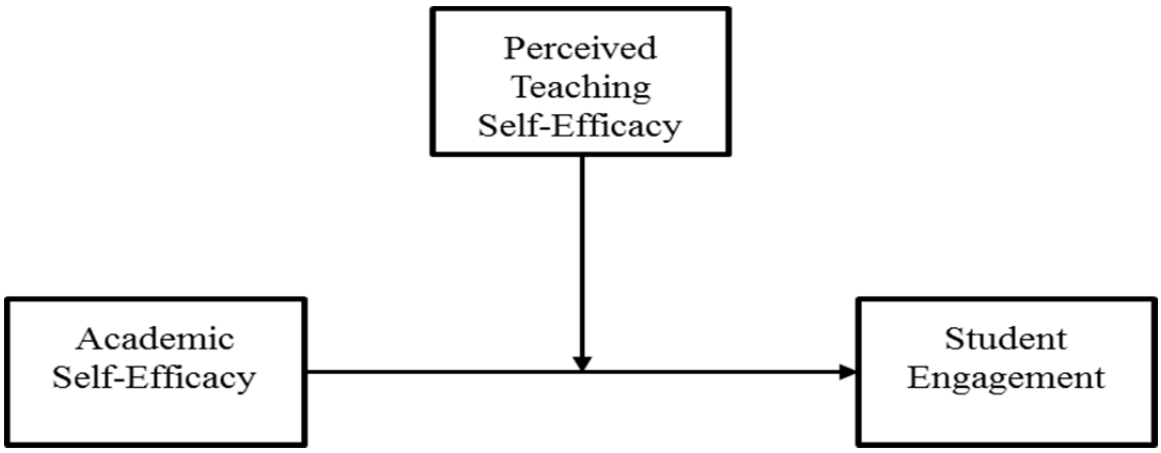

Figure 5. Proposed moderation pathway between ASE and student engagement.

CHAPTER III

METHOD

Design

A repeated measures study design was used to answer the research questions. A pre- and posttest of ASE were used to measure change over the course of one semester. PIE, student engagement, and academic outcomes were measured at the end of the semester as well.

Participants

Participants were recruited from three introductory psychology classes at midsized university in the western U.S. Three instructors participated in the study. Instructor 1 was a 31-year-old White man with 11 semesters of teaching experience and 1 semester of teaching experience at the present university. Instructor 2 was a 31-year-old White woman with 5 semesters of teaching experience and 1 semester of teaching experience at the present university. Instructor 3 was a 32-year-old White woman with 10 semesters of teaching experience, all of them at the present university.

Two hundred forty-four ($N = 244$) students participated in the study. Most of the students were White ($n = 217$, 88.9%), first-year ($n = 165$, 67.6%), women ($n = 181$, 74.2%), about 19.5 years old ($M = 19.56$, $SD = 2.66$), and were fairly high achieving (Mean GPA = 3.52, $SD = 0.47$).

Materials

Academic Self-Efficacy

Owen and Froman's (1988), College Academic Self-Efficacy Scale (CASES) was used to measure students' academic self-efficacy. The scale consisted of 33 items. Students were asked to rate the amount of confidence they have for the various tasks like "participating in a class discussion" or " writing a high quality term paper". The student then answered from *very little* (1) to *quite a lot* (5). The mean score was used to calculate the composite score for the CASES. The scale was administered by Owen and Froman in two sessions spaced eight weeks apart. The reported internal consistency (Chronbach's α) was .90 and .92. Chronbach's α for the present study was .91 (pretest) and .94 (posttest). This and all measures can be found in the Appendix.

Teaching Self-Efficacy

In order to measure TSE, Tschannen-Moran and Woolfook Hoy's (2001) Teachers' Sense of Efficacy Scale (TSES) long form was used. The 24-item scale consisted of three subscales: efficacy in student engagement (ESE), efficacy in instructional strategies (EIS), and efficacy in classroom management (ECM). Each item was rated on a 9-point Likert-type scale that ranged from *none at all* (1) to a *great deal* (9). The mean score was used to create the composite score for the TSES.

Items that pertain to ESE asked questions like, "How much can you do to get through to the most difficult students?" and "How much can you do to help your students think critically?" EIS items asked questions such as "How well can you respond to

difficult questions from your students?" while ECM items asked questions like "How much can you do to control disruptive behavior in the classroom?" The reported reliability (Chronbach's α) of each of the ESE, EIS, and ECM subscales are .87, .91, and .90, respectively. Chronbach's α for the present study was .91, .90, and .90, respectively. The composite of all three subscales (TSES) had a reported reliability of .94 and a .96 for the present study. The authors presented factor loadings of the 24 items which ranged from .47-.75 and Eigenvalues of 10.38, 2.03, and 1.62 for the EIS, ECM, and ESE factors, respectively. The authors examined the construct validity of the TSES and concluded that the measure is able to assess personal teaching efficacy.

Each of the instructors was asked to complete the TSES. In addition, for the present study, students were asked to rate their teacher's efficacy. Participants were given a modified form of the TSES (MTSES). This modified form changed the word "you" in each of the items into "your instructor" and deleted the word "your." Both the instructor's self-reported TSE and the students' perceptions were measured and then compared to check for consistency (see results section below).

Student Engagement

Handelsman and colleagues' (2005) measure of college student course engagement the Student Course Engagement Questionnaire (SCEQ) was used to assess overall student engagement. This 23-item questionnaire measured four factors of student engagement: skills, emotional, participation/interaction, and performance. Students were asked to read each item and rate to what extent that item characterized them. Each item is rated on a 5-point Likert-type scale that ranged from 1 (*not at all characteristic of me*) to

5 (*very characteristic of me*). The reported reliability (Chronbach's α) for skills, emotional, participation/interaction, and performance engagement subscales was .82, .82, .79, and .76, respectively, which are acceptable reliability coefficients (Handelsman et al., 2005). Chronbach's α for the present study was .87, .82, .72, and .86 for each of the subscales and .91 for the composite.

Academic Outcomes

To assess the academic outcome of the students, their final course grades were assessed via reports from their instructors. Instructors were asked to report the percentage as well letter grade.

Procedures

Instructors were contacted to participate in the presented study. Instructors were generally briefed on the study and given a letter of information. Each of the instructors was e-mailed a survey link at the beginning and end of the semester for students that wanted to participate and instructors posted the link to the course management website, Canvas. Each of the instructors offered course credit for participation in the study.

During the first week of instruction, announcements were made in class about participation of the present study. Students were then given a week to participate in the study. Students that participated logged on to Canvas and clicked on the posted survey link. Once students accessed the link, they were presented with the informed consent and could download a PDF version of the document for their records. Those who consented to the study then completed the CASES as well as general demographic information

survey that recorded their age, race, sex, class standing, GPA, years in school, and years attended at the university. Students also provided a unique 4-digit identifier (i.e., the last four digits of their student ID number) so pre- and posttest results could be matched.

During the last week of instruction, announcements were made again in class about participation in the present study. Students were then given a week to participate in study and participation needed to conclude before final exams were administered. Students accessed the survey, provided their 4-digit identifier, and completed the CASES, MTSES, and SCEQ. Reports of the students who participated in the survey were e-mailed to each of the instructors so they could award students credit. Each of the instructors were also e-mailed a survey link and completed the TSES and a demographics form that asked them to report their age, sex, race, and years of teaching experience (overall and at the present university). Once the semester ended, instructors were prompted to send the grades of students that participated in the study. Each of the instructors was given a report of the students' 4-digit identifiers. The instructors matched the 4-digit identifiers to a percentage and letter grade and e-mailed the report back to the author. Each of the grades was then matched to the students collected data.

Data Analysis Plan

The first research question asked if changes in ASE over the course of a semester would predict student engagement and academic outcome. To answer this question a change score was calculated by subtracting the students' mean beginning of the semester CASES score from their mean end of the semester CASES score. The resulting change

score was a positive number, negative number, or a "0." Two simple linear regressions were used to determine whether change score predicted student engagement and whether change score predicted academic outcome.

The second research question asked if student engagement mediated or moderated the relationship between ASE and academic outcomes. According to the past literature, a mediation analysis would be appropriate because a student needs to engage with the material in order to achieve good academic outcomes. However, it is completely possible that there are students that do not fully engage in the material and still achieve good academic outcomes. In this case, a moderation analyses would be a better test of this phenomenon.

The final research question asked if the students' perceived TSE of the instructor moderated the relationship between the students' academic self-efficacy and their course engagement. A moderation analysis was conducted to determine if such a relationship existed among these three variables.

CHAPTER IV

RESULTS

Three hundred forty-six students completed the measures at the beginning of the semester and a total of 280 students completed the measures at the end of the semester. Of the 280 students, 244 students completed the measures at the beginning and end of the semester and were 18 years of age or older. Participants were recruited in September of 2013 and data collection ended in December of 2013. Descriptive data analyses showed that the data were significantly skewed for student engagement, academic self-efficacy at the end of the semester, perception of instructor efficacy, and grade (Shapiro-Wilks, $p <$ .001). However, the analyses conducted with and without the transformed data did not affect the outcomes of the analyses. Thus, the descriptive and inferential analyses were conducted using the untransformed data for ease of interpretation.

Preliminary Results

Comparisons of Men and Women

Independent samples *t* test results revealed that academic self-efficacy for men (n = 63) and women (n = 181) was similar at the beginning of the semester. At the end of the semester, however, women reported lower (M = 3.54) ASE than men (M = 3.76). There were also significant differences between men and women and their perception of the instructors teaching self-efficacy (PIE). Women rated their instructor's efficacy higher (M = 6.73) than men (M = 6.34). Men and women did not differ significantly in terms of their self-reported course engagement or grades (see Table 1).

Table 1

Mean Comparisons of Study Variables Between Men and Women

	Men		Women					
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*	*p*	Cohen's *d*
Pre ASE	3.62	0.43	3.63	0.51	242	-0.10	.920	0.01
Post ASE	3.76	0.53	3.54	0.64	242	2.40	.017	0.46
PIE	6.34	1.18	6.73	1.31	242	-2.09	.038	0.27
Engagement	3.44	0.57	3.48	0.59	242	-0.56	.577	0.09
Grades	85.05	12.24	86.26	10.71	234	-0.73	.466	0.07

Comparisons of White and Ethnic Minority Students

White (n = 210) and ethnic minority (n = 26) students did not significantly differ in their reports of ASE, PIE, or student engagement (see Table 2). However, significant differences were found between White and ethnic minority students in terms of course grade with White students having higher grades on average than ethnic minority students.

Comparisons of Students Across Classrooms

Data were collected for three sections of introductory psychology, each taught by a unique instructor. See Table 3 for student grades and PIE by section. Some course grades could not be matched with the student and those cases were excluded from the analysis (n = 9). Differences across groups were tested with analysis of variance (ANOVA). ANOVAs revealed significant differences in perception of instructor's efficacy (see Table 4) and course grades (see Table 5) across groups. Post hoc analyses showed the average grade in instructor 1's class was significantly lower than the average grade in instructor 2's class and neither class differed from the average grade of instructor

Table 2

Mean Comparisons of Study Variables Between White and Ethnic Minority

	White		Ethnic minority					
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*	*p*	Cohen's *d*
Pre ASE	3.64	0.49	3.57	0.49	242	0.69	.492	0.09
Post ASE	3.60	0.61	3.60	0.73	242	-0.01	.995	0.00
PIE	6.59	1.24	6.99	1.55	242	-1.52	.129	0.20
Engagement	3.47	0.58	3.46	0.59	242	0.12	.903	0.02
Grades	86.87	10.90	78.54	10.14	234	3.70	< .001	0.45

Table 3

Mean PIE and Course Grade Across Instructors

Instructor	*n*	PIE	Grade
1	140	6.38[a]	82.86 [a]
2	73	7.05[b]	91.59 [b]
3	31	6.77[a]	86.91[a]

[a] No significant difference.
[b] Significant difference.

Table 4

Analysis of Variance of PIE Across Instructors

Source	*SS*	*df*	*MS*	*F*	η^2
Between groups	21.64	2	10.82	6.88**	.05
Within groups	379.30	241	1.57		
Total	400.95	243			

** $p < .01$.

Table 5

Analysis of Variance of Course Grade Across Instructors

Source	*SS*	*df*	*MS*	*F*	η^2
Between groups	3520.51	2	1760.26	16.09***	.01
Within groups	25484.77	233	109.38		
Total	29006.28	235			

*** $p < .001$.

3's class. However these results must be interpreted with caution since there are more students represented from instructor 1's class than from the other classes and effect sizes for these differences across classes are modest. In addition the average PIE score of instructor 1 was significantly lower than the PIE score of instructor 2 but neither instructor differed from instructor 3. Further examination of PIE show that students tend to rate their instructors the same or higher than instructors rate themselves (see Table 6).

Research Question 1

The first research question was: Do changes in ASE predict student engagement and course grade in a different sample? To answer the first research question, a change score was created by subtracting students' academic self-efficacy score at the end of the semester (post ASE) from their score at the beginning of the semester (pre ASE). This change score was then used to predict their course grade and student engagement. The results of the regression analysis shows that changes in ASE positively predict student grades ($\beta = .18$, $p = .006$) and student engagement ($\beta = .34$, $p < .001$; see Table 7).

Table 6

Means and Mean Differences Between Instructors' Self-Report and PIE

Instructor	Self-report	PIE	Mean difference	*ES* (*d)*
1	5.38	6.38	1.00***	1.57
2	6.33	7.05	0.72***	1.20
3	6.82	6.77	-0.05	.08

*** $p < .001$.

Table 7

Change Scores Predicting Grades and Student Engagement

Outcome	B	SE	β	*t*	*p*	R	R^2
Grade	3.07	1.33	.18	2.78	.006	.18	.03
Engagement	0.37	0.07	.34	5.70	<.001	.34	.12

Note. Change score = Post ASE- Pre ASE score. Change scores were used as predictor variables for each regression.

Research Question 2

The second research question was: Does student engagement mediate or moderate the relationship between ASE and course grade? To answer the second research question, moderation and mediation analyses of student engagement were used to determine its effect on the relationship between ASE and course grade. There was a strong relationship between course engagement and post ASE score and moderate correlations were found between course engagement, post ASE score and grades (see Table 8). A mediation analysis determined if student engagement mediated the relationship between ASE and grades. However, there are confounds associated with testing mediation effects. The

Table 8

*Correlation Matrix of Grades, Study Variables, and Change Score (*N = *242)*

	1	2	3	4	5	6
1. Grade [a]	-					
2. Pre ASE	.16*	-				
3. Post ASE	.28***	.55***	-			
4. Engagement	.30***	.38***	.60***	-		
5. PIE	.07	.04	.09	.27***	-	
6. Change	.18**	-.28*	.65***	.34***	.06	-
M	85.95[a]	3.63	3.60	3.47	6.63	-.03
SD	11.10[a]	0.49	0.62	0.58	1.28	.54

[a] *N* = 236; Grade = Percentage grade; Pre ASE = Academic self-efficacy at the beginning of the semester; Post ASE = Academic self-efficacy at the end of the semester; ENG = Student course engagement; PIE = Perception of instructor efficacy; Change = Pre ASE – Post ASE scores.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

distribution of the mediation effect is not normal (Bollen & Stine, 1990) and measurement error in the observed score can lead to an underestimation of the mediated effect (Baron & Kenny, 1986; Hoyle & Smith, 1994). Thus, a biased-correcting bootstrap method with 500 draws was used in order to correct for the nonnormal distribution of the mediated effect. Past literature has shown that this technique produces the most accurate confidence intervals (MacKinnon, Lockwood, & Williams, 2004).

The results of the mediation revealed that student engagement partially mediated the relationship between ASE and grades (see Figure 6). However, significant correlations were found between skills, emotion, and performance engagement and ASE and grades (see Table 9). Each of these subscale scores were tested as possible mediators

Table 9

*Correlation Matrix of Measure Subscales, ASE, Change Score, and Grade (*N = *242)*

	1	2	3	4	5	6	7	8	9	10	11
1.Performance	-										
2.Participation	.24***	-									
3.Emotion	.52***	.49***	-								
4.Skill	.59***	.42***	.57***	-							
5.PECM	.13	.18**	.28***	.15*	-						
6.PEIS	.10	.22***	.31***	.12	.76***	-					
7.PESE	.07	.30***	.33***	.17**	.72***	.83***	-				
8.Post ASE	.49***	.46***	.48***	.47***	.08	.08	.09	-			
8.Pre ASE	.32***	.31***	.27***	.30***	.04	.04	.04	.55***	-		
10.Change	.27***	.25***	.30***	.27***	.07	07	.06	.65***	-.28***	-	
11.Grade [a]	.48***	.09	.22***	.26***	.08	.06	.04	.28***	.16*	.18**	-
M	3.84	2.83	3.55	3.72	6.96	6.75	6.19	3.60	3.62	-0.02	85.95
SD	0.81	0.70	0.78	0.70	1.35	1.38	1.45	0.62	0.49	0.31	11.11

[a] *N* = 236; Performance = Performance engagement; Participation/Interaction engagement; Emotion = Emotion engagement; Skill = Skill engagement; PECM = Student perception of instructor efficacy of classroom management; PEIS = Student perception of instructor efficacy of instructional strategy; PESE = Student perception of instructor efficacy of student engagement; Pre ASE = Academic self-efficacy at the beginning of the semester; Post ASE = Academic self-efficacy at the end of the semester; Change = Pre ASE – Post ASE scores; Grade = Percentage grade.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

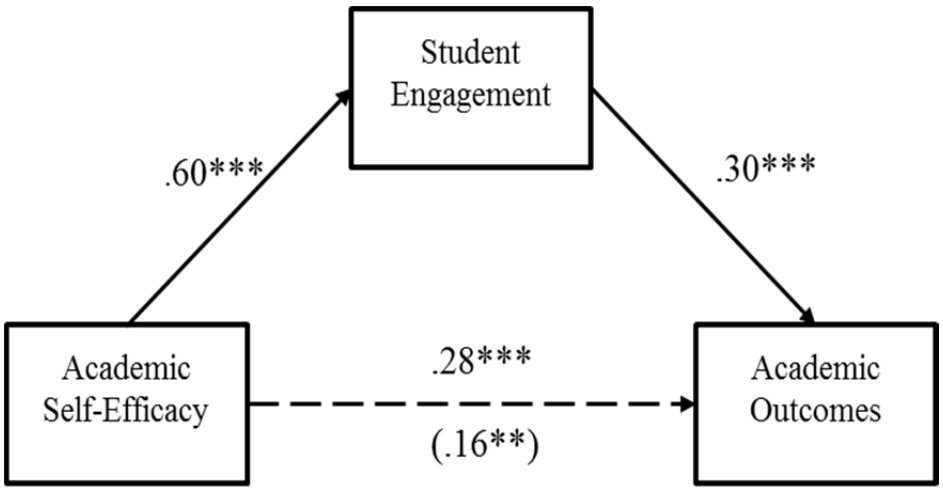

Figure 6. Student engagement as a partial mediator between academic self-efficacy and academic outcomes.

and are presented in Table 10. Emotion engagement did not have a mediating effect between ASE and grades. Skills engagement partially mediated the relationship between ASE and grades (see Figure 7). Performance engagement fully mediated the relationship between ASE and grades (see Figure 8). Moderation analyses to determine if student engagement moderated the relationship between ASE and grades revealed no statistically significant relationships.

Additional analyses were conducted to explore the individual contributions of each dimension of academic engagement. Skills, emotional, participation/interaction, and performance were each entered stepwise into a regression model and students' ratings of ASE at the end of the semester (post ASE) were also entered as a final step into the regression model (see Table 11). Skills engagement was a significant predictor of grade when controlling for emotional and participation/interaction engagement. However, when

Table 10

Mediation Analysis Results with Engagement Mediators

	Total effect		Total indirect effect		Total direct effect	
Mediator	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Engagement	.28 (.07)***	[.15, .41]	.12 (.04)**	[.04, .20]	.16 (.08)*	[.00, .31]
Skills	.28 (.07)***	[.15, .41]	.08 (.04)*	[.01, .15]	.20 (.07)**	[.06, .35]
Performance	.28 (.07)***	[.16, .41]	.22 (.05)***	[.13, .31]	.07 (.07)	[-.08, .21]

Note. All entries are standardized estimates. Standard errors of the estimates are in parentheses.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

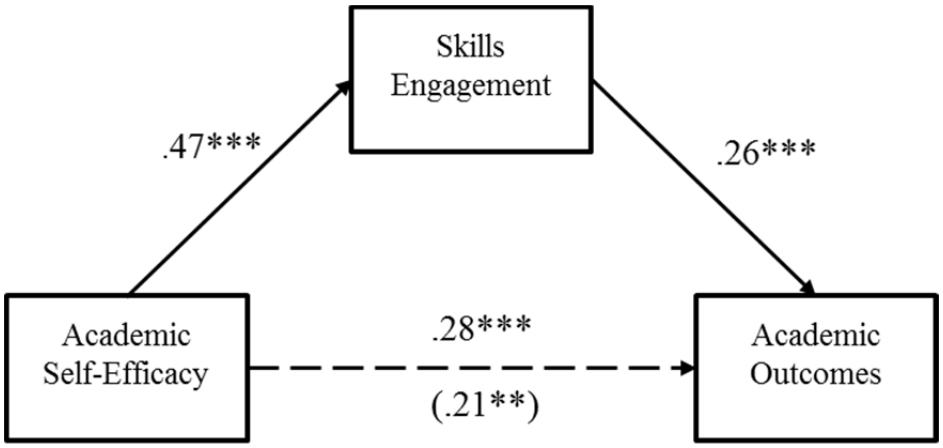

Figure 7. Skills engagement as a partial mediator between academic self-efficacy and academic outcomes.

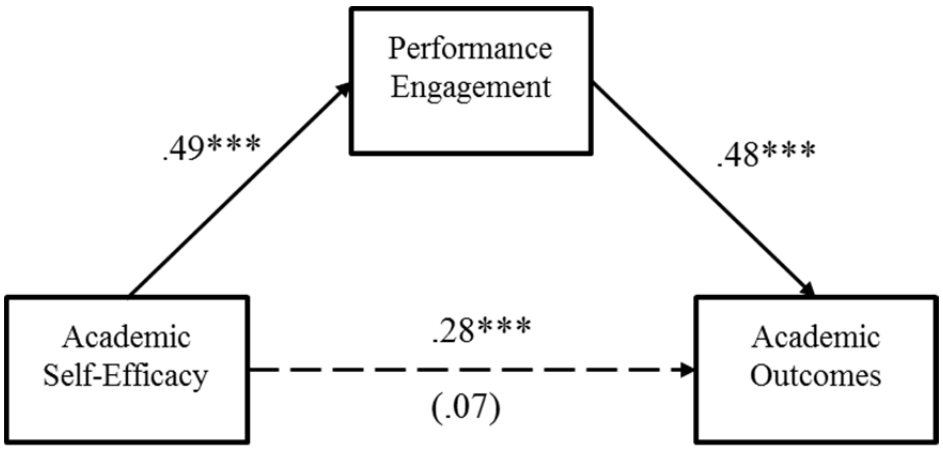

Figure 8. Performance engagement as a full mediator between academic self-efficacy and academic outcomes.

performance engagement was entered into the model, performance effectively accounted for the variance of the other three types of engagement when predicting grade. Finally, when students' ASE is entered into the model, performance engagement still accounted for most of the variance.

Research Question 3

Research question 3, Does PIE affect the relationship between students' ASE and student engagement?, required a moderation and mediation analysis to determine if PIE mediated or moderated the relationship between Post ASE and student engagement. A strong relationship was found between course engagement and ASE and a moderate relationship was found between PIE and student engagement. There was no significant relationship between PIE and ASE (see Table 8). A correlation of the ASE, PIE subscales, and student engagement subscales revealed significant correlations between

Table 11

Hierarchical Regression Analyses with Engagement Subscales and Post ASE as Predictors of Grade

Model	Predictors	B	SE	β	*t*	*p*	R	R^2	ΔR^2	ΔF	*p*
1	Skills	4.16	1.02	.26	4.06***	< .001	.26	.07	.06	16.51***	< .001
2	Skills	3.10	1.27	.19	2.44*	.015	.27	.07	.01	2.00	.158
	Emotional	1.57	1.11	.11	1.41	.158					
3	Skills	3.34	1.29	.24	2.58**	.010	.28	.08	.00	.090	.345
	Emotional	7.94	1.18	.14	1.648	.101					
	Participation	-1.09	1.15	-.07	-0.95	.345					
4	Skills	-0.17	1.29	-.01	-0.13	.895	.48	.23	.15	46.01***	<. 001
	Emotional	-0.38	1.13	-.03	-0.34	.737					
	Participation	-0.37	1.06	-.02	-0.35	.725					
	Performance	6.88	1.01	.51	6.78***	< .001					
5	Skills	-.037	1.27	-.02	-0.29	.774	.49	.24	.01	2.16	.143
	Emotional	-0.56	1.13	-.04	-0.50	.619					
	Participation	-0.86	1.11	-.06	-0.77	.440					
	Performance	6.47	1.05	.48	6.17***	< .001					
	Post ASE	1.91	1.30	.11	1.47	.143					

Note. All models include student grade as the outcome variable. Performance = Performance engagement; Participation/Interaction engagement; Emotion = Emotion engagement; Skill = Skill engagement; Post ASE = Academic self-efficacy at the end of the semester.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

participation engagement and emotional engagement with the three PIE subscales and modest correlations between skills engagement and the perception of the instructor's efficacy of classroom management (PECM) and student engagement (PECM; see Table 9). However, since no relationships between the PIE subscales and ASE were found a mediation and moderation analysis could not be conducted. Still, both PIE and ASE are significant predictors of student engagement and when entered as predictors in a regression model (see Table 12).

Table 12

PIE and ASE as Predictors of Student Engagement

Predictors	*B*	*SE*	*β*	*t*	*p*	R^2
PIE	0.10	.02	.22	4.45***	<.001	.40
Post ASE	0.54	.05	.516	11.53***	<.001	

***$p < .001$.

CHAPTER V

DISCUSSION

It seems that changes in ASE do predict course grade and student engagement. In addition, the relationship between the predictor and outcomes were positive in that a positive change in engagement led to higher grades and engagement. This finding aligns with past research in that ASE was predictive of student academic performance and student engagement (Bresó et al., 2011; Choi, 2005; Galyon et al., 2012) and also showcased ASE as a fluid construct (Galyon et al., 2012). Past research has also uncovered differences across men and women in terms of ASE and in the same direction (i.e., men score higher in ASE for social sciences; Huang, 2013). However, there are no clear explanations for why there would or would not be sex differences. Future researchers should explore the discrepancy between men and women attending college in terms of changes in ASE with the intention of understanding these differences. In the present study, men and women started the semester with equal ASE ratings but at the end of the semester men's ASE tended to increase while women's ASE tended to decrease. Why is there this change in ASE for men in women in opposite directions? Men and women report roughly the same amount of course engagement and obtain roughly the same grades and yet perceptions of their abilities differ and magnitude of the difference showed a moderate to strong effect.

Student engagement in the form of performance engagement mediated the relationship between ASE and student grade. This finding aligns with past research (Miller, Greene, Montalvo, Ravindran, & Nichols, 1996; Senko & Harackiewicz, 2005)

and is further supported by the results of the hierarchical regression. Students with higher performance engagement were the ones who endorsed getting a good grade, doing well on the tests, and being confident that they could learn and do well in the class. It should not be surprising then that performance engagement was correlated with ASE and course grade. However, skill, emotional, and participation/interaction engagement are needed to achieve that performance engagement. The students that reported doing well and were confident about doing well in the class were the students that utilized the other forms of course engagement to achieve the grade they received in the class. Future researchers may examine these engagement processes to design interventions or strategies to help students achieve their academic goal even if they may not have the capacity at the outset of the course.

Future researchers may also explore the discrepancy of academic outcomes between White and ethnic minority students. Although there was no difference across groups in the present sample in terms of reported ASE or engagement, there was a moderate to strong effect in the difference between White and ethnic minorities' grades. Other factors must come into play that affect ethnic minority students in the classroom and may involve the instructor or peers. Systematic oppression may be a factor but may not be readily detectable at the classroom level. It is recommended that future researchers recruit ethnically diverse samples to further investigate the discrepancy between ethnic minority and White students. In addition, having a more ethnically diverse sample would allow research to investigate interaction effects between sex and ethnic group membership.

PIE does not impact the relationship between a student's ASE and their engagement in the course. Still, it useful to know that both ASE and PIE are significant predictors of student course engagement. Students' perceptions of their instructor's TSE influenced how they engaged in the course and are a significant area of further research. Preliminary data analyses suggest that there are notable differences in PIE for men and women. Although nonsignificant, ethnic minority and White students tend to differ in PIE as well. Further research should explore why there are these differences. Women and ethnic minority students seem to have higher ratings of PIE than men and White students. These findings run counter to those of Basow, Codos, and Martin (2013) who found that men tended to give higher ratings than female students on professor's student teaching factors. The authors found that students rated professors more positively when their professors were White and male. Further research in this area is needed to clarify and resolve this discrepancy. Future studies may want to examine interaction effects of professor sex and race with student sex and race and the impacts of these interactions on student engagement, PIE, ASE, and academic outcome. The results of these studies will be beneficial in understanding the interplay between all these different factors and the impact on students and instructors in higher education.

Limitations

The design of the present study allowed for examination of changes in ASE over the course of the semester. However, analyses of the trend of changes in ASE could not be conducted because data was collected on only two measurement occasions. Additional

measurement occasions would allow researchers to determine the trend of ASE over time. The study was correlational and thus causal inferences could not be made. Moreover, there was only one measurement of PIE, student course engagement, and grade. Additional measurements of PIE over time would allow researchers to examine initial perceptions of their instructor's teaching-self efficacy and subsequent changes as the semester progresses. Additional measurements of course engagement would researchers to evaluate initial student engagement and shifts over time. As an outcome variable, course grades can be useful as a summary of a student's academic performance but do not give any insight to the academic performance of a student over time. Examination of lab, quiz, and exam grades would have provided insight into a student's academic performance over time and also serve as an indicator of course engagement.

Adding additional measurement occasions of PIE, student course engagement, and grades would allow researchers to examine trends (e.g., linear, quadratic) for these variables over time and their interaction with ASE. Researchers could then examine trends in ASE, PIE, engagement, and grades for men versus women, White students versus ethnic minority students, and interactions of sex by ethnicity. Analyzing these trends could shed light on the development of these constructs over the semester and its impact of academic outcomes.

The data analyses in the present study were sufficient for answering the research questions but would have been improved through the use of latent variables and structural equation modeling (SEM). Using latent variables allows researchers to analyze data without the confound of measurement error. The mediated effect of student engagement

may be underestimated in the present research since measurement error will attenuate the true effect of the mediator on the relationship on the direct effect between X and Y (MacKinnon, 2008). SEM (e.g., path analysis) allows the researchers to examine the relationship between all the given variables and explain relationships in one class of data analysis instead of a cluster of different data analyses.

In addition, observed change score models are limited in their utility because they can be considered tautological and may not actually represent the change of a variable over time (see Benjamin, 1973, and Etaugh & Etaugh, 1972, for more discussion on this topic). While change scores may be appropriate for detecting changes in experimental designs, it may not be appropriate for correlational designs due to lack of causal inference and (Overall & Woodward, 1975). To overcome this limitation, latent change models can be used to examine changes in the construct over time without calculating a change score and accounting for measurement error between each measurement occasion (see McArdle & Prindle, 2008, for an example).

A significant difference in ASE ($d = 0.27$, $p = .035$) was also found between students that completed the study ($N = 244$, $M = 3.62$, $SD = 0.49$) and those who did not ($N = 81$, $M = 3.49$, $SD = 0.50$). This suggests that students with lower ASE were less likely to complete the study. This is a limitation because students with lower ASE were not represented in the sample and were systematically excluded in this regard. Although this limits generalizability of the findings of this study, it does show future researchers should consider strategies to make sure students with varying ASE level are retained. It may also be beneficial to examine the behavior of students with lower ASE in particular.

It may be that these students participate/engage in the classroom differently from students with average or high ASE and may also be a group of interest for academic intervention.

Finally, it should be noted that even though there were significant differences found between ethnic minority and White students, the number of ethnic minority students was relatively small (n = 26, 11%). This is number somewhat reflects the population at the university (ethnic minority = 16%) but is an aggregate of non-White students and the results of the study cannot be generalized to all the different ethnic groups captured in this composite. Thus a limitation of the study is that inter-ethnic differences could not be determined. Students in each ethnic group may vary in their perceptions of their instructor and differ in levels and type of course engagement.

Conclusions

The present study contributes to the body of knowledge by showing that students that engage in the course have better outcomes. Students that increase their academic self-efficacy over the semesters are more engaged and have better academic outcomes. Instructors play their part by influencing student engagement in the classroom. Thus, to answer the question of why some students participate and others do not, it seems that students that want to do well in the course, will. Instructors help those students who want to do well by positively influencing their engagement in the course. The advice that can be taken from this study is that if students want to do well in the course will find ways to engage in the course to help them succeed and are bolstered in their success if they perceive their instructor as having good TSE.

REFERENCES

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*, 117-148.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich, CT: Information Age.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology*, *51*, 1173-1182.

Basow, S., Codos, S., & Martin, J. (2013). The effects of professors' race and gender on student evaluations and performance. *College Student Journal*, *47*, 352-363.

Benjamin, L. S. (1973). Remarks on behalf of change scores and associated correlational statistics: A response to the Etaughs. *Developmental Psychology, 8,* 180-183.

Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*, *20*, 115-140.

Bresó, E., Schaufeli, W. B., & Salanova, M. (2011). Can a self-efficacy-based intervention decrease burnout, increase engagement, and enhance performance? A quasi-experimental study. *Higher Education*, *61*, 339-355. doi: 10.1007/s10734-010-9334-6

Choi, N. (2005). Self-efficacy and self-concept as predictors of college students' academic performance. *Psychology in the Schools*, *42*, 197-205. doi: 10.1002/pits.20048

Daniels, L. M., Stupinsky, R. H., Pekrun, R., Haynes, T. L., Perry, R. P., & Newall, N. E. (2009). A longitudinal analysis of achievement goals: From affective antecedents to emotional effects and achievement outcomes. *Journal of Educational Psychology*, *101*, 948-963. doi: 10.1037/a0016096

Etaugh, A. F., & Etaugh, C. F. (1972). Overlap: Hypothesis or tautology? *Developmental Psychology*, *6*, 340-342.

Fritchner, L. M. (2000). Inside the undergraduate college classroom: Faculty and students differ on the meaning of student participation. *The Journal of Higher Education*, *71*, 342-362.

Galyon, C. E., Blondin, C. A., Yaw, J. S., Nalls, M. L., & William, R. L. (2012). The relationship of academic self-efficacy to class participation and exam performance. *Social Psychology of Education*, *15*, 233-249. doi: 10.1007/s11218-011-9175-x

Gibson, S., & Dembo, M. (1984). Teacher efficacy: Construct validation. *Journal of Educational Psychology*, *76*, 569-582.

Gurung, R. A. R., Daniel, D. B., & Landrum, R. E. (2012). A multisite study of learning in introductory psychology courses. *Teaching of Psychology*, *39*, 170-175. doi: 10.1177/0098628312450248

Handelsman, M. M., Briggs, W. L., Sullivan, N., & Towler, A. (2005). A measure of college student course engagement. *The Journal of Educational Research*, *98*, 184-192. doi: 10.3200/JOER.98.3

Hartley, J., & Davies, I. K. (1978). Note taking: A critical review. *Programmed Learning and Educational Technology*, *15*, 207-224.

Howard, J. R., & Henney, A. L. (1998). Student participation and instructor gender in the mixed age college classroom. *The Journal of Higher Education*, *69*, 384-405.

Hoyle, R. H., & Smith, G. T. (1994). Formulating clinical research hypotheses as structural equation models: A conceptual overview. *Journal of Consulting & Clinical Psychology*, *62*, 429-440.

Huang, C. (2013). Gender differences in academic self-efficacy: A meta-analysis. *European Journal of Psychology of Education*, *28*, 1-35. doi: 10.1007/s10212-011-0097-y

Karp, D. A., & Yoels, W. C. (1976). The college classroom: Some observations on the meaning of student participation. *Sociology & Social Research*, *60*, 421-439.

Klassen, R. M., Tze, V. M. C., Betts, S. M., & Gordon, K. A. (2011). Teacher efficacy research 1998-2009: Signs of progress or unfulfilled promise? *Educational Psychology Review*, *23*, 21-43. doi: 10.1007/x10648-010-9141-8

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. New York, NY: Erlbaum.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99-128.

McArdle, J. J., & Prindle, J. J. (2008). A latent change score analysis of a randomized clinical trial in reasoning training. *Psychology & Aging*, *23*, 702-719. doi: 10.1037/a0014349

Miller, R. B., Greene, B. A., Montalvo, G. P., Ravindran, B., & Nichols, J. D. (1996). Engagement in academic work: The role of learning goals, future consequences, pleasing others, and perceived ability. *Contemporary Educational Psychology*, *21*, 388-422.

Nunn, C. E. (1996). Discussion in the college classroom: Triangulating observational and survey results. *The Journal of Higher Education*, *67*, 243-266.

Overall, J. E., & Woodward, A. J. (1975). Unreliability of difference scores: A paradox for measurement of change. *Psychological Bulletin*, *82*, 85-86.

Owen, S. V., & Froman, R. D. (1988, April). *Development of a College Academic Self-Efficacy Scale*. Paper presented at the 1998 annual meeting of the National Council on Measurement in Education, New Orleans, LA.

Rocca, K. A. (2010). Student participation in the college classroom: An extended multidisciplinary literature review. *Communication Education*, *59*, 185-213. doi: 10.1080/03634520903505936

Senko, C., & Harackiewicz, J. M. (2005). Regulation of achievement goals: The role of competence feedback. *Journal of Educational Psychology*, *97*, 320-336. doi: 10.1037/0022-0663.97.3.320

Sitzmann, T., Ely, K., Bell, B. S., & Bauer, K. N. (2010). *Journal of Experimental Psychology: Applied*, *16*, 281-292. doi: 10.1037/a0019968

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85,* 571-581.

Skinner, E. A., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of Educational Psychology*, *82*, 22-32.

Smith, D. H. (1977). College classroom interaction and critical thinking. *Journal of Educational Psychology*, *69*, 180-190.

Stine, L. (2004). The best of both worlds: Teaching basic writers in class and online. *Journal of Basic Writing*, *23*, 49-69.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching & Teacher Education*, *17*, 783-805.

U.S. Department of Education, National Center for Education Statistics. (2012). *Digest of Education Statistics, 2011* (NCES 2012-001). Retrieved from http://nces.ed.gov/programs/digest/d11/ch_3.asp

Weaver, R. R., & Qi, J. (2005). Classroom organization and participation: College students' perceptions. *The Journal of Higher Education*, *76*, 570-601.

Welker, J., & Berardino, L. (2005-2006). Blended learning: Understanding the middle ground between traditional classroom and fully online instruction. *Journal of Educational Technology Systems, 34,* 35-55.

Wood, R. E., & Locke, E. A. (1987). The relation of self-efficacy and grade goals to academic performance. *Educational & Psychological Measurement, 47,* 1013-1024.

APPENDIX

College Academic Self-Efficacy Scale

Directions: For each statement below, circle the letter that best represents your confidence.

Amount of Confidence

A B C D E
Quite A lot <----------->Very Little

How much confidence do you have about each of the behaviors listed below?					
1. Taking well-organized notes during a lecture.	**A**	**B**	**C**	**D**	**E**
2. Participating in a class discussion.	**A**	**B**	**C**	**D**	**E**
3. Answering a question in a large class.	**A**	**B**	**C**	**D**	**E**
4. Answering a question in a small class.	**A**	**B**	**C**	**D**	**E**
5. Taking "objective" tests (multiple-choice, T-F, matching).	**A**	**B**	**C**	**D**	**E**
6. Taking essay tests.	**A**	**B**	**C**	**D**	**E**
7. Writing a high quality term paper.	**A**	**B**	**C**	**D**	**E**
8. Listening carefully during a lecture on a difficult topic.	**A**	**B**	**C**	**D**	**E**
9. Tutoring another student.	**A**	**B**	**C**	**D**	**E**
10. Explaining a concept to another student.	**A**	**B**	**C**	**D**	**E**
11. Asking a professor in class to review a concept you don't understand.	**A**	**B**	**C**	**D**	**E**
12. Earning good marks in most classes.	**A**	**B**	**C**	**D**	**E**
13. Studying enough to understand content thoroughly.	**A**	**B**	**C**	**D**	**E**
14. Running for student government office.	**A**	**B**	**C**	**D**	**E**
15. Participating in extracurricular events (spots, clubs).	**A**	**B**	**C**	**D**	**E**
16. Making professors respect you.	**A**	**B**	**C**	**D**	**E**
17. Attending class regularly.	**A**	**B**	**C**	**D**	**E**
18. Attending class consistently in a dull course.	**A**	**B**	**C**	**D**	**E**
19. Making a professor think you're paying attention in class.	**A**	**B**	**C**	**D**	**E**
20. Understanding most ideas you read in your tests.	**A**	**B**	**C**	**D**	**E**
21. Understanding most ideas presented in class.	**A**	**B**	**C**	**D**	**E**
22. Performing simple math computations.	**A**	**B**	**C**	**D**	**E**
23. Using a computer.	**A**	**B**	**C**	**D**	**E**
24. Mastering most content in a math course.	**A**	**B**	**C**	**D**	**E**
25. Talking to a professor privately to get to know him or her.	**A**	**B**	**C**	**D**	**E**
26. Relating course content to material in other courses.	**A**	**B**	**C**	**D**	**E**
27. Challenging a professor's opinion in class.	**A**	**B**	**C**	**D**	**E**
28. Applying lecture content to a laboratory session.	**A**	**B**	**C**	**D**	**E**
29. Making good use of the library.	**A**	**B**	**C**	**D**	**E**
30. Getting good grades.	**A**	**B**	**C**	**D**	**E**
31. Spreading out studying instead of cramming.	**A**	**B**	**C**	**D**	**E**
32. Understanding difficult passages in textbooks.	**A**	**B**	**C**	**D**	**E**
33. Mastering content in a course you're not interested in.	**A**	**B**	**C**	**D**	**E**

Teacher Sense of Efficacy Scale

Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.	**Nothing** (1)	(2)	**Very Little** (3)	(4)	**Some** (5)	(6)	**Quite a Bit** (7)	(8)	**A Great Deal** (9)
1. How much can you do to get through to the most difficult students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. How much can you do to help your students think critically?	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. How much can you do to control disruptive behavior in the classroom?	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. How much can you do to motivate students who show low interest in schoolwork?	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. To what extent can you make your expectations clear about student behavior?	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. How much can you do to get students to believe they can do well in school work?	☐	☐	☐	☐	☐	☐	☐	☐	☐
7. How well can you respond to difficult questions from your students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. How well can you establish routines to keep activities running smoothly?	☐	☐	☐	☐	☐	☐	☐	☐	☐
9. How much can you do to help your students value learning?	☐	☐	☐	☐	☐	☐	☐	☐	☐
10. How much can you gauge student comprehension of what you have taught?	☐	☐	☐	☐	☐	☐	☐	☐	☐
11. To what extent can you craft good questions for your students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
12. How much can you do to foster student creativity?	☐	☐	☐	☐	☐	☐	☐	☐	☐
13. How much can you do to get children to follow classroom rules?	☐	☐	☐	☐	☐	☐	☐	☐	☐
14. How much can you do to improve the understanding of a student who is failing?	☐	☐	☐	☐	☐	☐	☐	☐	☐
15. How much can you do to calm a student who is disruptive or noisy?	☐	☐	☐	☐	☐	☐	☐	☐	☐
16. How well can you establish a classroom management system with each group of students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
17. How much can you do to adjust your lessons to the proper level for individual students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
18. How much can you use a variety of assessment strategies?	☐	☐	☐	☐	☐	☐	☐	☐	☐
19. How well can you keep a few problem students from ruining an entire lesson?	☐	☐	☐	☐	☐	☐	☐	☐	☐
20. To what extent can you provide an alternative explanation or example when students are confused?	☐	☐	☐	☐	☐	☐	☐	☐	☐
21. How well can you respond to defiant students?	☐	☐	☐	☐	☐	☐	☐	☐	☐
22. How much can you assist families in helping their children do well in school?	☐	☐	☐	☐	☐	☐	☐	☐	☐
23. How well can you implement alternative strategies in your classroom?	☐	☐	☐	☐	☐	☐	☐	☐	☐
24. How well can you provide appropriate challenges for very capable students?	☐	☐	☐	☐	☐	☐	☐	☐	☐

Student Course Engagement Questionnaire

Directions: This questionnaire is designed to help us understand the kinds of things that create difficulties for students in classrooms. Please indicate how much you agree or disagree with each of the statements below. Your answers are confidential.

How much does this describe you?				
Not At All Characteristic of Me (1)	Not Really Characteristic of Me (2)	Moderately Characteristic of Me (3)	Characteristic of Me (4)	Very Characteristic of Me (5)

1.	I make sure to study on a regular basis.	(1)	(2)	(3)	(4)	(5)
2.	I put forth effort.	(1)	(2)	(3)	(4)	(5)
3.	I do all the homework problems.	(1)	(2)	(3)	(4)	(5)
4.	I stay up on the readings.	(1)	(2)	(3)	(4)	(5)
5.	I look over class notes between classes to make sure I understand the material.	(1)	(2)	(3)	(4)	(5)
6.	I am organized.	(1)	(2)	(3)	(4)	(5)
7.	I take good notes in class.	(1)	(2)	(3)	(4)	(5)
8.	I listen carefully in class.	(1)	(2)	(3)	(4)	(5)
9.	I come to class every day.	(1)	(2)	(3)	(4)	(5)
10.	I find ways to make the course material relevant to my life.	(1)	(2)	(3)	(4)	(5)
11.	I apply the course material to my life.	(1)	(2)	(3)	(4)	(5)
12.	I find ways to make the course interesting to me.	(1)	(2)	(3)	(4)	(5)
13.	I think about the course between class meetings.	(1)	(2)	(3)	(4)	(5)
14.	I really desire to learn the material.	(1)	(2)	(3)	(4)	(5)
15.	I raise my hand in class.	(1)	(2)	(3)	(4)	(5)
16.	I ask questions when I don't understand the instructor.	(1)	(2)	(3)	(4)	(5)
17.	I have fun in class.	(1)	(2)	(3)	(4)	(5)
18.	I participate actively in small-group discussions.	(1)	(2)	(3)	(4)	(5)
19.	I go during the professor's office hours to review assignments or tests or to ask questions.	(1)	(2)	(3)	(4)	(5)
20.	I help fellow students.	(1)	(2)	(3)	(4)	(5)
21.	I get a good grade out of the class.	(1)	(2)	(3)	(4)	(5)
22.	I do well on the tests.	(1)	(2)	(3)	(4)	(5)
23.	I am confident that I can learn and do well in the class.	(1)	(2)	(3)	(4)	(5)