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EFFECTS OF PROVIDING A RATIONALE FOR LEARNING A LESSON ON STUDENTS' MOTIVATION AND LEARNING IN ONLINE LEARNING ENVIRONMENTS

by

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ABSTRACT

EFFECTS OF PROVIDING A RATIONALE FOR LEARNING A LESSON ON STUDENTS' MOTIVATION AND LEARNING IN ONLINE LEARNING ENVIRONMENTS

by

Tae Seob Shin

This study examined whether providing a rationale for learning a particular lesson influences students' motivation and learning in online learning environments. A mixed-method design was used to investigate the effects of two types of rationales (former student vs. instructor rationales) presented in an online introductory educational psychology course. Fifty-nine participants were randomly assigned to one of the three conditions: (1) a student rationale condition where students listened to a brief testimonial of a former student about the value of the presented lesson (2) an instructor rationale condition where students listened to an audio statement by the instructors about the value of the presented lesson and (3) a control condition where students were not provided with any rationale. The treatment was given at the beginning of six two-week modules, each of which covered one specific topic in educational psychology.

Pre- and post-tests, which included self-report questionnaires measuring students' perceptions about the value of the course, interest in the course, self-determination, autonomous regulation, and their essay responses to a series of short movie clips depicting various educational phenomena, were administered at the beginning and end of the semester. At the end of semester, students' grades and perceptions of learning were also collected.

Results suggest that providing a rationale for learning had positive effects on students' motivation and learning and its effects were affected by the source of rationale. In terms of motivation, students' sense of autonomy increased over time whether they listened to student or instructor rationales. Students who listened to instructor rationales reported an increase in their sense of relatedness to instructors, while those who listened to student rationales reported a decrease in their relatedness to instructors. In terms of learning, both the quantitative and qualitative results indicate that listening to rationales provided by former students had the most positive effect on students' final grades and their ability to apply major ideas covered in the course to real-life problems. Findings suggest that student rationales can be effective in promoting students' motivation and learning in an online learning context.

This study adds to the existing body of literature by examining whether the source of rationale matters in promoting students' learning and motivation. The current study also focuses on the learning aspects of provisions of rationales. By triangulating different learning outcome measures, a better understanding of the effects of providing a rationale has on students' learning has been achieved. In addition, the design of this study demonstrates how research grounded in theory can be conducted with strong ecological validity when implemented in regular online courses. Unlike other studies where inauthentic tasks were given, this project was done in a natural academic setting. Finally the kinds of treatments that were developed for this study can easily be implemented in teaching practices in face-to-face or online environments.

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TABLE OF CONTENTS

LIST OF TABLES ---------- viii

CHAPTER 1: INTRODUCTION ---------- 1
Statement of the Problem ---------- 1
Purpose of the Study ---------- 2
Theoretical Framework ---------- 2
Organization of Chapters ---------- 4

CHAPTER 2: LITERATURE REVIEW ---------- 6
The Value of Aspects of Motivation ---------- 6
Motivational Strategies and Techniques to Foster Students' Appreciation of Value ---------- 10
Effects of Providing Rationales on Student Motivation ---------- 13
Rationales Provided by Former Students vs. Course Instructors ---------- 15
Self-Determination in Online Learning Environments ---------- 17
Need for the Current Study ---------- 18
Research Questions/Hypotheses ---------- 19
Definitions of Terms ---------- 22

CHAPTER 3: METHODS ---------- 24
Research Design ---------- 24
Participants ---------- 25
Sample Size Justification ---------- 26
Study Context ---------- 26
Experimental Conditions ---------- 27
Procedure ---------- 30
Measures ---------- 31

CHAPTER 4: QUANTITATIVE RESULTS ---------- 37
Motivation ---------- 37
Learning ---------- 41
Discussion of Quantitative Results ---------- 42

CHAPTER 5: QUALITATIVE RESULTS ---------- 45
Overview of the Qualitative Data ---------- 45
Students' Immediate Responses ---------- 46
Students' Essay Responses ---------- 50
Discussion of Qualitative Results ---------- 53

CHAPTER 6: DISCUSSION ---------- 55
Limitations ---------- 56
Future Research ---------- 57

Implications ---------- 58

APPENDICES ---------- 77
A: MOTIVATION MEASURES ---------- 78
B: LEARNING MEASURES ---------- 80
C: BACKGROUND INFORMATION ---------- 82
D: REFLECTION ITEMS ---------- 84
E: TRANSCRIPTION OF MOVIE MONTAGE ---------- 85

REFERENCES ---------- 91

LIST OF TABLES

Table 1: Participants' Grade Levels by Conditions ---------- 61

Table 2: Degree Requirement by Conditions ---------- 62

Table 3: Participants' Desire to Pursue Teaching Careers ---------- 63

Table 4: Participants' Online Learning Experiences by Conditions ---------- 64

Table 5: Initial Familiarity with the Topics ---------- 65

Table 6: Initial Interest in the Topics ---------- 66

Table 7: A Priori Power Analysis (N=66) Using Effect Sizes Reported in Jang (2008) ---- ---------- 67

Table 8: Six Role Models that Represent the Former Students ---------- 68

Table 9: Example of a Script of a Student Rationale (Module 2) ---------- 69

Table 10: Example of a Script of an Instructor Rationale (Module 2) ---------- 70

Table 11: Descriptive Statistics of Motivation Measures ---------- 71

Table 12: Descriptive Statistics of Learning Measures ---------- 72

Table 13: Correlations among Dependent Variables ---------- 73

Table 14: Analysis Framework: Evidence of Knowledge ---------- 75

Table 15: Descriptive Statistics of Knowledge Development ---------- 76

CHAPTER 1

INTRODUCTION

Statement of the Problem

Helping students appreciate the value of what they learn is one of the major challenges teachers face. Research has shown that students who value what they learn in their classes tend to show higher achievement scores, engagement in the class activities, and level of interest than those who fail to appreciate the value of the content. Students who fail to appreciate the value of school content tend to show a significant decrease in their motivation to engage in the school related activities. This devaluing process is a serious concern in education as it is associated with various maladaptive behaviors such as losing interest in the course material or being easily distracted in the class (Jang, 2008; Legault et al., 2006; Vallerand, Fortier, & Guay, 1997). Similar effects of appreciation of value on students' learning and motivation can be observed across all grade levels, domains, and disciplines (Brophy, 2004; Hidi, 1990; Wigfield & Eccles, 2000).

Despite the obvious need to develop students' appreciation for learning, many teachers struggle to achieve this goal for various reasons. First, teachers often fail to recognize or appreciate the value of school learning themselves (Brophy, 2004). This is particularly true in subject-matters such as history or social studies that seem to have little relevance to daily life. Second, even if teachers realize the value of the content, they may not be equipped with pedagogical knowledge needed to foster students' appreciation of the value of school content. In a classroom where teachers are faced with large individual differences and time constraints, it may be challenging to develop instructional strategies that promote students' appreciation of the value of learning (Brophy, 2008a, 2008b).

The first challenge discussed above relates to the theoretical issues that this study aims to address. Specifically, this study provides a literature review on the value aspects of motivation in education, explore underlying mechanisms aimed at fostering appreciation of value, and identify a theoretical model for developing motivational strategies for promoting value appreciation. The empirical part of this study addresses the second challenge concerning a practical issue in instruction and curriculum development. That is, this study examines whether providing a rationale for learning a lesson, which can be easily incorporated into teaching, has a positive influence on students' motivation and learning and tests whether the source of rationale matters (i.e., rationales provided by former students of the course vs. rationales provided by the course instructors).

Purpose of the Study

The purpose of this study is to examine whether providing a rationale for learning a particular lesson enhances students' motivation and learning. With regard to students' motivation, four constructs were the foci of this study: students' perceived value of the course, interest in the course, self-determination, and autonomous regulation. In terms of learning, students' final grades, perceived learning, and development of knowledge in educational psychology were examined. An experimental design involving random assignments to treatments was used to investigate the effects of two types of rationales (student vs. instructor rationales).

Theoretical Framework

This study is grounded within two major theoretical frameworks: the value aspects of motivation and self-determination theory. First, research in the value aspects of motivation serves as an important theoretical background for this study. Brophy (2008a)

points out that it is a teacher's responsibility to make students not only learn the new content taught in class but also to value it and want to learn more about it. He notes that in order to help students appreciate the value of a lesson teachers need to be competent in both content and pedagogical knowledge. In addition, they need to be sensitive to the learners' beliefs and attitudes towards the content.

Some of Brophy's suggestions on how to foster students' appreciation of the value of school content include: curriculum development, lesson framing, and scaffolding appreciation. He argues that teachers can help their students recognize and exploit the affordances of the content by explicitly explaining the value of the course material in ways that they can understand easily and by modeling how the big ideas and skills can be applied to real life (Brophy, 2008a). Although his paper mainly addresses motivational issues in K-12 settings, most of the principles he presents can be applied in post-secondary education, particularly in introductory survey courses where students have opportunities to explore their potential majors.

Self-determination theory also provides a foundation of this research. The theory suggests that students have three psychological needs that must be met in order to achieve self-regulation, intrinsic motivation, and personal well-being (Deci & Ryan, 2000; Ryan & Deci, 2000a; Urdan & Schoenfelder, 2006). These three psychological needs are: competence, autonomy, and relatedness. Competence refers to a feeling of accomplishment that is derived from effective functioning. Autonomy refers to the perception of control over one's own actions. Finally, relatedness refers to feelings of security and belonging in the social environment. Deci and Ryan (2000) propose that all three psychological needs are intertwined and that the fulfillment of these needs depends

on the social environment. To briefly sum up, the central notion of self-determination theory is that "people are inherently motivated to feel connected to others within the setting, to function effectively in it, and to feel a sense of personal initiative while doing so" (Brophy, 2004, p. 189).

A variety of motivational strategies have been developed to support the psychological needs of learners. Listening to students' opinions, providing formative feedback to students, providing optimal levels of challenge, and offering choices about homework are some of the strategies proven to facilitate students' intrinsic motivation (Brophy, 2004; Urdan & Schoenfelder, 2006). The current study, which examines students' motivation and learning in the context of an online introductory educational psychology course, focuses on how providing a rationale for learning a lesson that emphasizes the intrinsic and utility value affects the way students appreciate the value of learning various concepts and ideas in teaching and learning.

Organization of Chapters

Chapter 1 introduces theoretical and practical issues with regard to appreciation of value of school content. A brief overview of the value aspects of motivation and self-determination theory is also provided. Chapter 2 is a literature review section which includes an introduction to various motivational theories, a critical review of previous studies on the value aspects of motivation in education, and a summary of research findings which highlights the need of the current study. Research questions that guided this study are also provided in this chapter. Chapter 3 describes the research method of this study in detail. Chapter 4 presents quantitative results of the study, particularly focusing on the analyses of survey items. In Chapter 5, two pieces of qualitative data are

examined to see whether different patterns emerged across the two experimental conditions. Finally, Chapter 6 is a general discussion of the study which addresses its limitations, suggestions for future research, and theoretical and practical implications.

CHAPTER 2

LITERATURE REVIEW

Motivation literature can be categorized into three broad categories depending on the foci of the research. First, there is a body of research on expectancy aspects of motivation. Some of the topics that are addressed within this line of research include: expectation of success or failure and concerns about social comparisons. Another line of research is mostly concerned with the social milieu. Researchers from this tradition are interested in developing classroom motivational climates and goal structures that can promote students' motivation. Finally, there is a line of research that focuses on the value aspects of motivation in education. Research in the value aspects of motivation addresses value related motivational issues such as what makes school content valuable to learn and how teachers can help their students better appreciate it (Brophy, 1999; 2008a; 2008b).

The Value Aspects of Motivation

The value aspects of motivation addresses such questions as "Why should I care about learning this?" or "What will I get out of this course?" Several different theories in motivation specifically tap into these value aspects of motivation. Three traditional motivation theories that address the value aspects of motivation in education include: expectancy x value theory, interest theory, and self-determination theory (Brophy, 2004; 2008b). A brief overview of each theory will be provided in the following section.

Expectancy X Value Theory

Expectancy x value theory (Eccles & Wigfield, 2002; Wigfield & Eccles, 2000) posits that the amount of effort that students are willing to put into a learning activity is

determined by the product of (1) the degree to which they are likely to succeed in the given task and (2) the degree to which they value the processes and products of the task. According to expectancy x value theory, both the expectancy and value factors play an important role in forming students' motivation and if either one of them is not properly addressed students are unlikely to put maximum efforts into their learning.

Eccles and Wigfield (2002) further elaborated four major components of subjective task value that can influence students' achievement behaviors: attainment value, intrinsic value, utility value, and cost. Attainment value refers to the importance of doing well on the task in order to affirm our self-concept or fulfill our needs for achievement, power, or prestige. Intrinsic value refers to the enjoyment that we get from engaging in the activity or the interest we have in the content. Utility value refers to the role that engaging in the task may play in helping us to achieve current or future goals, such as career goals. Finally, Cost refers to negative aspects of engaging in the task, as well as the time, effort, or other resources required to complete it successfully and the foregone opportunities to use these resources to accomplish other goals (Eccles, et al., 1983; Eccles & Wigfield, 2002).

Research has shown that students perceive their tasks as an opportunity to demonstrate of their self-schemata such as masculinity and competence in specific domains. Wigfield and Eccles (1992) propose that tasks will have higher attainment value to the extent that they allow the individual to confirm salient aspects of these self-schemata. Prior research has also found that students who are engaged in tasks that they value intrinsically tend to show positive outcomes in psychological measures such as

intentions to continue to engage in academic activities (Eccles, et al., 1983; Wigfield & Eccles, 1992)

Interest Theory

Interest theory posits that two types of interest play different roles in initiating and sustaining student motivation (Hidi, 1990). Individual interest refers to a stable dispositional trait to engage with particular content or activities. Situational interest refers to a response or reaction that is triggered by stimuli embedded in the situation. Interest researchers have studied how each dimension of interest develops and how they are associated with other motivational constructs and learning.

According Hidi and Renninger (2006) one's interest develops through four phases. First, situational interest is triggered by features of a course material or learning environment. Then, the situation interest is maintained through various factors that sustain the level of engagement in a given task. In the next phase, individual interest emerges as students begin to appreciate the affordances and applications of the learning activities and show a higher level of engagement subsequently. Finally, if students continue to find the materials valuable and rewarding, they develop deeper and more creative forms of engagement (Hidi & Renninger, 2006). Brophy (2008b) suggests that an emphasis should be given on fostering students' positive attitudes toward learning a particular lesson in the earlier phases. According to him, in later phases, "forms of scaffolding that encourage students to take more initiative in self-regulating their own interest development" (Brophy, 2008b, p. 7) should be provided by teachers.

Research in interest has shown that students' level of individual interest affects their attention, concentration, attitude toward the content, comprehension of the text, and

performance in achievement tests (Hidi & Harackiewicz, 2000; Krapp, 2002; Renninger, 2000). Bergin (1999) identifies individual and situational factors that influence interest in a classroom setting. Individual factors include belongingness (e.g. cultural value, identification, and social support), emotions, competence, utility-goal relevance, and background knowledge. Situation factors include hands-on, discrepancy, novelty, food, social interaction, modeling, games and puzzles, content, fantasy, humor, and narrative.

Self-Determination Theory

Another motivational perspective that explores students' subjective experience during a task engagement is self-determination theory (Deci & Ryan, 2000). The theory posits that people are intrinsically motivated when they perceive themselves to be self-determined rather than being controlled by external factors such as rewards or threats. Early work in self-determination theory focused on investigating detrimental effects of extrinsic motivation (e.g., use of rewards) and the desirable effects of intrinsic motivation (Ryan & Deci 2000a, 2000b). Recently self-determination theorists started to acknowledge the need to shift their focus from the dichotomy of intrinsic versus extrinsic motivation to more practical issues such as "how can originally extrinsically motivated actions become self-determined through developmental processes of internalization and integration?" (Brophy, 2008b).

Deci and Ryan (2000) identify four types of extrinsic regulation: external, introjected, identified, and integrated regulation. External regulation is when people's actions are regulated by external factors such as rewards or pressures. In introjected regulation people's actions are driven by feelings of guilt. Identified regulation occurs when people adopt an introjected regulation or value and perceive it as personally

important and valuable. Finally, in integrated regulation, which is most similar to intrinsic motivation, identified values and regulations become integrated into the self. Using this framework, researchers have begun to develop motivational strategies that can help students shift from external or introjected regulation to identified or integrated regulation.

According to self-determination theory, external regulations can transform into internal regulations by going through the process of internalization. Internalization refers to "the transformation of an externally prescribed regulation or value into an internally adopted one" (Brophy, 2004; Deci & Ryan, 2000; Williams & Deci, 1996). It implies that initially controlled behaviors can become autonomous and self-determined when people assimilate external regulations and values and personally endorse them. Research has shown that the process of internalization is associated not only with behavioral regulations but also with values, attitudes, and other learning outcomes (Deci & Ryan, 2000; Williams & Deci, 1996). When students are autonomously engaged in school learning, they tend to internalize and integrate the values and fully accept them as their own values (Brophy, 2004).

Motivational Strategies and Techniques to Foster Students' Appreciation of Value

Several motivational strategies have been developed to stimulate students' appreciation of the value of school content. One way to stimulate appreciation is to frame content or learning tasks in a manner that enhances their relevance to students. Some of the content framing strategies include: linking content to students' interests and needs, explicitly stating how content is related to students' prior learning, emphasizing the

current or future applicability of the lesson, and letting students reflect on the relevance of the lesson (Keller, 1987).

Relevance manipulation is another strategy that can help students realize the affordances and applications of content. For instance, Oades and Harackiewicz (2007) manipulated the perceived utility value of learning mathematics skills by providing explanations on how it can be useful for improving college students' cognitive skills, studying for other mathematics or statistics courses, and preparing for graduate school or future careers. They also asked students to write an essay about the potential relevance of what they learned in the class as applied to their everyday lives. The findings suggested that the relevance manipulation strategies were effective in increasing students' interest in the course when they perceived themselves to be competent in mathematics (Oades & Harackiewicz, 2007).

Jang (2008) proposes that teachers can promote students' motivation by providing a rationale that "(a) identifies the lesson's otherwise hidden value, (b) helps students understand why the lesson is genuinely worth their effort, (c) communicates why the lesson can be expected to be useful to them, and/or (d) helps students see or discover the personal meaning within a lesson" (Jang, 2008, pp. 798). An effective rationale which encompasses those components can create an opportunity in which students can appreciate the affordances and application of the given learning task.

Brophy (2008b) also proposes three motivational principles that can scaffold students' appreciation for school learning. First, he acknowledges the need for elaborating reasons for appreciating school learning. Brophy states that "the potential for appreciating their value lies primarily in the affordances they offer to those who engage

in them, particularly 1) the insights and understandings afforded by the big ideas that anchor content networks, and 2) the information processing, problem solving, and decision making opportunities afforded by activities designed to develop and apply those big ideas" (Brophy, 2008b). Often students have difficulty realizing the affordances provided by school content. Therefore, teachers need to provide careful elaborations on the value of the lessons.

Second, Brophy (2008b) emphasizes the importance of socializing and scaffolding appreciation of the value of school content. Socializing appreciation involves three steps: curriculum development, lesson structuring or framing, and scaffolding appreciation. In terms of curriculum development, teachers and policy makers have to be careful about which content and activities to include in the curriculum. Only those worth learning should be chosen and taught to students. Lessons structuring or framing is also important in socializing appreciation. When teaching lessons, teachers should explain the value and become a model on how to apply the big ideas and concepts. The other step in enhancing appreciation is scaffolding. Teachers need to encourage students discover the value of engaging in learning activities and provide assistances that can help them notice and realize the affordances of the activities.

Finally, Brophy introduces the notion of a motivational zone of proximal development. Students exhibit a wide range of levels of appreciation of the value of school content. Some students may already be able to appreciate the value of what they learn but others may have difficulty understanding it. There also is variability in the affordances of content. It may be relatively easy to see the value of some content while other content may be too abstract for students. Brophy concludes that curriculum

developers and teachers need to work within the motivational zone of proximal development to insure that students have opportunities to develop appreciations of the value of school learning (Brophy, 2008b).

Effects of Providing Rationales on Student Motivation

Reeve et al. (2002) investigated the effects of the provision of externally provided rationales in an autonomy-supportive way on students' self-determination, effort, and interest. In their study, college students were asked to take a two-part lesson in conversational Chinese. The experimental group watched a 90-second videotape which contained an introductory statement about the lesson. They provided three different reasons to try hard. For the external regulation group, they presented a forthcoming test as a reason to study hard (e.g., "the reason we are asking you to try hard during conversational Chinese is because we are going to give you a test on the materials to evaluate how well you studied the information."). In the introjected regulation group, students were told that they had to try hard because it was what they ought to do as pre-service teachers (e.g., "The reason we are asking you to try hard to during conversational Chinese is because doing so is what today's classroom teacher should do."). In the control condition, instead of showing a video clip, the screen simply showed a title for each lesson.

The researchers found that the externally provided rationales communicated in an autonomy-supportive way positively influenced students' identification experience. Identification was conceptualized as "the moment-to-moment experience in which the person accepts, personally endorses, and values the effort put forth during the uninteresting activity" (Reeve et al., 2002). Although the rationale was initiated by a

teacher, students perceived it as autonomy-supportive and, consequently, exerted high level of effort. Reeve and his colleagues (2002) demonstrated that carefully communicated rationales for learning can facilitate students' appreciation of the value of the content and their subsequent effort.

In a similar study, Jang (2008) reported that providing a rationale for learning during an uninteresting activity was effective in promoting students' engagement and learning. In her study, undergraduate students asked to participate in an uninteresting lesson on statistics were randomly assigned to either the experimental condition where they received a rationale or the control condition where no rationale was provided. The rationale was designed to enable students to perceive the uninteresting task as important enough to put their efforts into it and help them understand the connection between this task and their personal goals (Jang, 2008). She found that students in the rationale condition scored higher on self-determination measures, use of interest-enhancing strategies, behavioral engagement, and conceptual learning than their counterparts in the control condition.

Despite the experimental nature of her study, the author acknowledged several limitations. First, the study was not conducted in an ongoing authentic learning context. A single 20-minute lesson on correlation may not have been the most adequate setting to examine the effects of a rationale, due to its short period of treatment. Second, Jang used a multiple-choice test to assess students' factual and conceptual learning at the end of the treatment and made an argument that students who received the rationale showed greater conceptual learning. It was unclear, however, whether their scores on learning measures

improved as a result of the rationale treatment, because their pre-test scores were not collected.

Rationales Provided by Former Students vs. Course Instructors

Prior research examining the effects of providing a rationale for learning was mostly concerned with rationales provided by teachers or instructors (Deci & Ryan, 1994; Jang, 2008; Reeve et al., 2002). This intervention appeared reasonable given that verbal or written explanations about the value of the lesson are commonly practiced in the classroom. According to self-determination theory, however, the top-down approach to providing a rationale for learning could negatively affect students' self-determination. For instance, students can perceive the instructor's statement as controlling and forceful and, as a result, their sense of autonomy can be undermined. In addition, students may not pay attention to the instructor's statement because they have low perceived relatedness to the instructor or the class (Jang, 2008).

One way to scaffold students' appreciation of value without undermining students' self-determination is to provide the rationale through a different channel of communication. In particular, a rationale provided by a former student of the course can be effective not only in supporting students' self-determination but also in helping them see the value of what they learn in the course. It is autonomy-supportive because the rationale comes from a former student who does not impose any pressure. It also takes into account the need of relatedness because students are likely to feel connected to a person who shared the same learning experience with them.

Providing a rationale for learning can be considered a persuasion strategy because the goal is to change students' perception and attitude towards a specific activity.

Persuasion refers to a technique that consists of "presenting arguments and facts, reasoning, drawing conclusions, and spelling out the positive results of a recommended course of action" (Zimbardo & Leippe, 1991, p. 127). Hovland et al. (1953) argues that convincing a person to pursue a recommended course of action can only be accomplished if he or she accepts the notion that adopting the message's position will bring out reinforcement.

Zimbardo and Leippe (1991) further elaborate six mental steps involving the persuasion process: 1) Exposure to message, 2) attention to message, 3) comprehension of message, 4) acceptance of its conclusion, 5) retention of new attitude, & 6) translation of attitude to behavior. Their model suggests that a message can affect people's belief only if it is learned through various steps. Learning requires that people pay attention to the message and comprehend it by understanding the beliefs it proposes. If people perceive the message as compelling, then they would accept its conclusion and change their attitudes accordingly (Zimbardo & Leippe, 1991).

Research in persuasion theory has identified several factors that influence the persuasion process. One factor is the message qualities which refer to the validity, strength, and compellingness of the message. Zimbardo and Leippe (1991) argue that "the arguments need to withstand the scrutiny of comparison with what the audience already knows, and they need to link the recommended position to the audience's existing attitudes" (Zimbardo & Leippe, 1991, p. 150). Another factor is the relevance of the message. Petty et al. (1981) found that whether the message was considered relevant to students or not had a significant effect on whether they agreed with the argument. In particular, they found that for high relevance subjects, the strong message was far more

persuasive than the weak message. Finally, the characteristics of the source of persuasion play a critical role in convincing people to change their belief and behaviors. People are more likely to be persuaded when they perceive the persuader to be a member of the same community. The source may appear similar to the people who are being persuaded and, thereby activating a schema that people with similar background tend to share commonalities (Brock, 1965; Hovland, Janis, & Kelley, 1953).

Self-Determination in Online Learning Environments

Recently much research has been done on learners' motivation in online courses. Yet there is relatively little research that explored the motivational aspects of new learning environments from a traditional motivational perspective. Among the few, a couple of empirical studies deserve a closer investigation. Roca and Gagne (2008) explored how workers' perception of autonomy support, competence, and relatedness in regard to online learning environments affect their perception of usefulness, playfulness, and ease of use, of which are found to be important antecedents of e-learning continuance intention. The path analysis suggests that there is a positive relation between workers' self-determination and their perceived usefulness and playfulness, which in turn, positively affect behavioral intention to continue to use the e-learning system.

Xie et al. (2006) examined how students' self-determination affected their engagement in an online discussion in which they participated as part of a regular face-to-face course. In particular, they were interested in the relations among perceived value/usefulness, interest/enjoyment, and feelings of autonomous regulation in online discussion. They found that if students perceived the online discussion as valuable, interesting, and enjoyable, they tended to show a high level of engagement. Another

interesting finding was that students' interest in and perceived value for participating in online discussion dropped steadily over time. Students' responses suggested that lack of facilitation by the instructor and lack of interaction among peers might have resulted in the declines in motivation. Xie et al. also pointed out a possibility that students' interest decreased over time as the act of participating in online discussion became less novel, eventually becoming a boring activity for them.

Need for the Current Study

In sum, the current study aimed at addressing some of the key issues that had not been directly explored in the previous studies. First, this study investigated whether providing a rationale for learning a lesson throughout a semester in an intact class would show positive effects on students' motivation and learning as shown in the previous studies that were conducted in a controlled laboratory setting. This study, while ensuring a strong internal validity by randomly assigning participants into different experimental conditions, was designed to yield a strong ecological validity by providing interventions throughout a whole semester.

Another important question that has not been answered in prior research is whether the source of rationale matters to students' motivation and learning. Past studies on the provision of rationale primarily focused on the effect of instructor rationales on students' engagement and learning and found that it is important for teachers to provide rationales for learning in an autonomy supportive manner. Little research, however, explored the motivational effect of rationales provided by former students. Brophy (2008b) argues that people who already have well developed interests in particular areas can testify about the affordances and applications of the school content in a way that

novice learners can appreciate the value of what they learn. The current study examined the effects of rationales given by former students and by faculty instructors on students' motivation and learning.

Finally, this study was conducted in an online course where the form of learning is quite different from that of a typical face-to-face course. One affordance of an online learning environment is that various technologies can be incorporated into the course. In this study, student and instructor rationales were presented in an audio format to help students better appreciate the value of what they would learn in the new lesson. In addition, little research has explored the motivational aspects of changes in students' self-determination over time in this new online learning context. This study should provide insight on whether students' sense of competence, autonomy, and relatedness change over time and how they were affected by the source of rationale.

Research Questions/Hypotheses

Motivation

Based on research in the value aspects of motivation and self-determination theory, four major research questions were generated to guide this research. The first question is whether providing a rationale for learning has an effect on students' motivation.

Question 1: Does providing a rationale for learning a module influence students' motivation?

Question 1.1: Does providing a rationale for learning a module influence students' appreciation of value?

Question 1.2: Does providing a rationale for learning a module influence students' interest in the course?

Question 1.3: Does providing a rationale for learning a module influence students' self-determination?

Question 1.4: Does providing a rationale for learning a module influence students' autonomous regulation?

The second question is whether the source of rationale affects students' motivation.

Question 2: Do the effects of providing a rationale on students' motivation vary by the source of rationale presented (student vs. instructor rationale)?

To answer these questions, the analysis focuses on changes in students' perceptions about the value of the course content, interest in the course, self-determination, and autonomous regulation over time. These questions are particularly important because they not only examine whether providing a rationale is an effective instructional strategy that can promote students' motivation but also help us determine whether the source of rationale matters in fostering students' appreciation of the value of school content.

Prior research suggests that externally provided rationales facilitate students' engagement, interest, internalization of regulations, and appreciation of value (Jang, 2008: Reeve et al., 2002; Williams & Deci, 1996). Therefore, it was hypothesized that students in the two experimental conditions would show higher gains in all four motivational measures compared to the students in the control condition. As an

exploratory analysis, this study also examines whether the magnitude of changes in students' motivation over time would vary depending on the source of rationale.

Learning

The third research question is whether providing a rationale for learning influences students' learning as measured by their final grades and perception of learning. The fourth question is whether the source of the rationale affects students' learning as observed in their development of knowledge. The analysis focuses on group differences in students' final grades, perceived learning, and knowledge development over time.

Question 3: Does providing a rationale for learning a module influence students' learning?

Question 3.1: Does providing a rationale for learning a module influence students' grades?

Question 3.2: Does providing a rationale for learning a module influence students' perceptions of their learning?

Question 4: Does the effect of providing a rationale on students' learning vary by the source of the rationale presented (former student vs. instructor rationales)?

Question 4.1: Does providing a rationale for learning a module influence changes in students' knowledge development?

Based on the literature on the value aspects of motivation and self-determination theory, it was expected that students in the experimental conditions would show higher gains in performance scores and receive better grades compared to those in the control

condition. As for perceived learning and knowledge development, no specific hypotheses were generated and left as exploratory questions.

Definitions of Terms

Motivation

Value is defined as how a task meets different needs of individuals (Wigfield & Eccles, 2000). The concept of value has two major components: intrinsic value and utility value. *Intrinsic value* refers to the enjoyment a person gains from engaging in the task. *Utility value* refers to how a task fits into a person's current or future goals (Hulleman et al., 2008; Wigfield & Eccles, 2000). *Interest* is defined as positive emotions toward specific tasks, objects, events, or ideas (Bergin, 1999; Bianco, Higgins, & Klem, 2003). *Self-Determination* is defined as the extent to which an action is freely chosen, not controlled by internal need or external force. Three psychological needs of self-determination are: autonomy, competence, and relatedness. *Autonomy* refers to self-determination in deciding what to do and how to do it. *Competence* refers to developing and exercising skills for manipulating and controlling the environment. *Relatedness* refers to affiliation with others through prosocial relationships (Brophy, 2004; Deci & Ryan, 2000). Finally, *autonomous regulation* refers to the degree to which students integrate the material being taught into their own way of thinking and behaving (Williams & Deci, 1996).

Learning

Final Grade is operationalized as the total points an individual student receives throughout the semester. *Perceived learning* is defined as "the set of beliefs and feelings one has regarding the learning that has occurred" (Caspi & Blau, 2008). *Knowledge*

development is defined as changes in students' knowledge about the materials covered in the course. (Brophy, 2008a; Schraw, 2006).

CHAPTER 3

METHODS

Research Design

A mixed-method design (Creswell, 2003; Ross & Morrison, 2004) was used in this study. Four sections of an introductory educational psychology course were offered online during the fall semester of 2009. Students enrolled in the course were randomly assigned to one of three conditions: (1) student rationale condition where rationales were provided by former students of the course, (2) instructor rationale condition where rationales were provided by course faculty instructors, and (3) no rationale condition where no rationales were provided externally.

Four graduate students taught the course as co-instructors under the supervision of two faculty members. Duties of the teaching assistant include course management, grading assignments, providing feedback, answering questions about the course materials, and taking care of administrative matters. Two teaching assistants worked as a team and took full responsibility of teaching two sections (e.g., Teaching assistant A & B assigned to sections 1 & 2).

Each team was assigned to one experimental condition (i.e., student rationale or instructor rationale condition) and one control condition (i.e., no rationale condition) so that any potential bias resulting from teaching assistant effects (e.g., discrepancy in grading between team A and B) could be addressed in the study. To prevent the confounding effect of teaching assistants additional measures were taken. First, all the teaching assistants graded students' work based on grading rubrics that were provided at the beginning of the course. Second, a teaching assistant with little or no experience in

teaching the course online was paired with a more experienced teaching assistant who served as a mentor.

Participants

All participants were enrolled in an online undergraduate introductory educational psychology course during the fall semester of 2009 at a large Midwestern university. Among the 74 students who were enrolled in the course, sixty-four students agreed to participate in this study at the beginning of the semester. Five of these students dropped the course during the semester, so that the final sample size was fifty-nine. A five dollar gift certificate was given to each participant as a monetary reward.

Demographic Information

Tables 1, 2, 3, and 4 include the demographic information about participants. In terms of the grade level, only two out of fifty-nine participants were freshmen. About 71% of the students were in their third year and beyond in the program. More than half (31 out of 59) of the participants took the course because it was a required course for teaching certificates and about 61% (36 out of 59) of them wanted to pursue their careers in teaching. Finally, about 41% (24 out of 59) of the participants reported that they had never taken an online course before.

Initial Familiarity and Interest

Students' familiarity and interest in the topics addressed in the course were also measured during the first week of the semester. As Tables 5 and 6 illustrate, the concepts of social interaction and motivation were among the most familiar and interesting topics for the participants regardless of their conditions. On the other hand, students across all

three conditions reported that the concepts of schemas and memory was the most unfamiliar and uninteresting topics to learn.

Sample Size Justification

Based on the effect sizes reported in Jang's (2008) study, a priori power analysis was conducted prior to the recruitment. Although her experiment was conducted in a different setting with different survey instruments, her study was used as a reference point because it was relatively recently published and provided raw data on means and standard deviations. The results of the power analysis suggest that an estimated sample size of sixty-six, which was the number of students who signed up for the course when the priori power analysis conducted, would yield adequate power for motivational variables (see Table 7).

Study Context

The study was conducted within a semester-long, online undergraduate introductory educational psychology course which is offered through a course management system called Moodle. Its goal is to help students understand the psychological and social processes and products of learning. The course deals with the complex, multi-faceted, and contextual nature of learning that occurs throughout the life span. During the course, students learn about various processes and contexts of learning, major theories of learning, and connections between learning theories and learning contexts. In short, it is an online introductory educational psychology course built on the assumption that "psychological theories and ideas relevant to education can provide important information for the design and improvement of teaching, learning, and schooling (Peterson, Dickson, & Clark, 1990).

There are several innovative aspects that make this online course distinctive (Mishra et al., 2009). First, the content is carefully designed to promote students' engagement in grounding abstract and theoretical issues of teaching and learning in multiple learning contexts. It not only addresses topics relevant to learning in school contexts but also taps into learning issues in non-school settings. This is supported by activities that ask students to explore learning in multiple contexts – through watching short movie clips, an interview assignment, and a book review assignment.

Second, the course uses various Internet-based resources and popular media to help students build rich conceptual understanding of the topics being addressed. Several multi-media formats have been incorporated into the course for both instruction and evaluation. Examples include YouTube clips, Flash-based magic tricks, memory games and experiments, Wikipedia, quizzes and polls. This rich range of multimedia formats allows students to look at the world of learning from new perspectives.

Finally, the course puts heavy emphasis on a spiral curriculum in which ideas need to be revisited in multiple contexts if they are to be learned and assimilated by students. For instance, in the first module, students watch short movie clips that represent learning in various ways. Then they are asked to discuss how the clips are relevant to learning. These clips have been carefully selected to match specific lessons that come up later in the semester, and students revisit the clips within these specific contexts. This spiral approach helps not only evaluate the students' growth in conceptual understanding but also make students self-aware about their progress and development.

Experimental Conditions

Student Rationale Condition

In this experimental condition students listened to an audio recording at the beginning of the module of a former student explaining how the presented module helped her/him in her/his career (while watching a page of text displaying the main points of her testimonial). The testimonials were delivered by graduate students who played the role of a former student for two major reasons. First, it had been only two years since the course was offered online, which made it hard to find any graduates working in the field. The other reason was that by having graduate students read the prepared scripts, the experimenter was able to control the content of each rationale, which was designed to emphasize both the intrinsic and utility value aspects of the module.

Based on the demographic information of the students enrolled in the previous semester, six role models were prepared to represent the current jobs of the former students. Since the course is offered by a teacher education program and the majority of students either pursue or are interested in pursuing a career in teaching, five of six role models represented teaching professions (e.g., school teachers, a coach, & a teacher education major). The other role was depicted as a non-education major who is currently working in the field of advertisement (see Table 8).

Although the details of the testimonials differed across the six modules, the overall format of the rationale remained consistent. The audio recording lasted about 60 seconds, during which a list of topics addressed in the module was displayed on the computer screen. Each former student testimonial had the components and examples presented in Table 9.

As soon as students completed hearing each rationale, an open-ended prompt which asked students to write why they felt the rationale was helpful or unhelpful to their

learning (in 25 words or less) was presented. This prompt helped students reflect on the rationale they received and also enabled the experimenter to monitor whether participants paid attention to the rationales or not (see Appendix D).

Instructor Rationale Condition

In this experimental condition, students listened to the instructors' explanation about the value of what students would learn in that particular module (while watching a presentation which displays the main points of their explanation). The rationale, which was jointly delivered by the two faculty instructors of the course, was provided at the beginning of each learning module. To control for noise variables associated with the multiple instructors, the faculty instructors took turns reading two or three sentences of the rationale. Each instructor rationale had the components and examples presented in Table 10.

The content of the instructor rationale contained (1) the same message (e.g., emphasis on intrinsic and utility values) and (2) the same level of specificity (e.g., detailed explanation about the value of the module) as the one provided in the student rationale. By holding the content and level of specificity constant across the two experimental condition, the experimenter was able to ensure that the difference in students' motivation and learning could be solely attributed to the source of rationale. As soon as students completed hearing each rationale, an open-ended prompt which asked students to write why they felt the rationale was helpful or unhelpful to their learning (in 25 words or less) was presented.

Control Condition

In the control condition, students were not provided any rationale externally.

Procedure

Treatment

Participants were randomly assigned to one of the three conditions: (1) a student rationale condition where students listened to a brief testimonial of a former student about how the presented module turned out to be valuable when she/he started her/his career (while text is presented in the screen), (2) an instructor rationale condition where students listened to an audio statement by the instructors about why the presented module is valuable (while text is presented as in the first condition), and (3) a control condition where students were not provided with any rationale for learning the presented lesson.

Condition Checks

To ensure that participants in the two experimental conditions (i.e., student & instructor rationale conditions) listened to the rationales that they were supposed to hear, a list of people who access the web pages that contained the audio files was acquired through a log report in Moodle. According to a log report 98% of participants (15 out of 16) in the student rationale condition and 80% of participants (12 out of 15) in the instructor rationale condition have accessed all six web pages containing the audio files during the semester.

Six Modules

The treatments were given at the beginning of six two-week modules, each of which covered one specific topic. The following major topics were covered in the course:

- Learning as Reinforcement
- Learning as Individual Cognitive Processing: Memory
- Learning as Individual Cognitive Processing (the Sequel): Schemas
- Learning as a Social Interaction

- Learning and Motivation
- Learning as Development

A pre- and post-test, which included questionnaires measuring students' perceptions about the value of the course, interest in the course, self-determination, autonomous regulation, and open-ended prompts that assess students' knowledge development were administered at the beginning and end of the semester respectively. Items measuring students' perceived learning were also added to the post-test survey (see Appendices A & B).

Measures

Pre-test measures

During the second week of the semester, after students became familiar with the course structure and schedule, students completed a questionnaire that contained items assessing their perceived value of the course, interest in the course, self-determination, and autonomous regulation. Demographic information and data on their familiarity and interest in learning each module were also collected (see Appendix C). All the self-report items were on 7-point Likert scales.

Motivation

Motivational measures consisted of the following scales (see Appendix A for a full list of items):

- Perceived Value
- Interest in the Course
- Self-Determination
- Autonomous Regulation

Self-report items used by Hulleman et al (2008) were adapted to assess students' ***perceived value*** which consisted of two sub-scales: utility value (Cronbach's $\alpha = .87$) and intrinsic value (Cronbach's $\alpha = .79$). Four items assessed utility value (e.g., what I am learning in this class is relevant to my life) and four assessed intrinsic value (e.g., when I am engaged in an activity in the course, I think about how much I enjoy it).

Interest in the course (Cronbach's $\alpha = .84$) was assessed with two self-report items (e.g., I enjoy taking this course very much) that was adopted from the instrument used by Harackiewicz et al. (2002).

The ***self-determination*** measures consisted of four sub-scales: perceived competence (Cronbach's $\alpha = .97$), perceived autonomy (Cronbach's $\alpha = .69$), perceived relatedness to peers (Cronbach's $\alpha = .73$), and perceived relatedness to instructors (Cronbach's $\alpha = .67$). Items used by Jang (2008) and Deci et al. (1994) were adapted to measure students' sense of perceived competence and autonomy. For perceived relatedness, items used by Roca & Gagne (2008) were adapted. Four items were used to assess perceived competence (e.g., I feel confident in my ability to learn the course materials). Perceived autonomy was assessed with two items (e.g., during the course I felt I was doing what I wanted to be doing). The perceived relatedness scale consisted of two sub-scales: relatedness to peers and relatedness to instructors. Two items measured perceived relatedness to peers (e.g., I'd like a chance to interact with my classmates more often) and two items measured perceived relatedness to instructors (e.g., I feel close to my instructors).

The ***autonomous regulation*** scale (Cronbach's $\alpha = .75$), which was initially developed by Deci et al. (1994), was also used in this study. The measure consisted of

four items (e.g., I actively participate in this course because I feel like it is a good way to improve my understanding of the material).

To check the reliability of the survey measures a pilot study was conducted during the summer semester of 2009. A total of thirty undergraduate students who were enrolled in either a undergraduate introductory educational psychology course or a undergraduate educational technology course during the summer participated in this pilot study. The Cronbach's α for each sub-scale of motivational measures ranged from .60 to .95 which was similar to what was reported in the previous studies (Deci et al., 1994; Deci & Ryan, 2000; Harackiewicz et al., 2002; Hulleman et al., 2008; Jang, 2008; Roca & Gagne, 2008).

In addition to the self-report survey items, one open-ended item was included to check whether students had any problem understanding the questionnaires. Since some of the survey items have been modified to fit better with the study context, it was necessary to check whether the items made sense to the students. None of the participants made any comment regarding the clarity of the survey items. Therefore, all the survey items used in the pilot study were included in the main study without any further modifications.

Learning

For the learning measures, students' responses to a prompt that asked them to write about various forms of learning taking place in the movie clips that they watched during the first week of semester were collected. This served as baseline data that was paired up with their responses from the last module of the course, when they revisited the clips and interpreted the scenes by applying the concepts and ideas that they learned throughout the course (see Appendix B).

Immediate responses

Immediately following the rationales, students in the two experimental conditions (i.e., student & instructor rationale condition) were asked to write a brief response to the rationales they heard. These immediate responses served two purposes. First, it captured what students thought of the rationales to which they listened. Responses of participants assigned to either the student or instructor rationale condition were qualitative analyzed. The immediate responses also served as an indicator of whether or not students had paid attention to the rationales.

End of modules 2 and 4 measures

At the end of modules 2 and 4, I assessed students' autonomous regulation using four items that were administered at the pre-test stage.

Post-test measures

Motivation

To assess students' motivation, the same questionnaire that had been used for the pre-test was re-administered during the last week of the course. In addition, three learning measures (i.e., final grades, perceived learning, & essay responses) were collected at the end of the semester.

Learning

Total points that students accumulated throughout the semester were calculated. The maximum possible point value was 100, and each student was given a numeric grade based on the percentage of their accumulated scores (e.g., 4.0 for 92.5% and above).

Rovai and Barnum (2003) argue that solely relying on grades as a way to measure students' learning maybe problematic for two reasons. First, grades may not accurately

represent what students have learned in the course. Some students may already have a good grasp of the course material when they signed up for the course. Second, grades can be inconsistently assigned depending on the instructors. This can be especially problematic in a course where multiple instructors or teaching assistants are involved in the course (Rovai & Barnum, 2003). Therefore, in addition to a traditional achievement measure, students' final grades, two more learning measures were incorporated into this study.

First, three self-report items that assess students' perception of their learning in the course were included in the post-test measure (e.g., on a scale of 1 to 7, how much did you learn in this course, with 1 meaning you learned nothing and 7 meaning you learned more than in any other course you've had?). Specifically, items measured students' perceived learning in an online course, perceived learning if taught traditionally, and perceived learning if taught by the ideal instructor. (Rovai & Barnum, 2003).

Second, students' essay responses to the movie clips that they watched during the first and last week of the semester were used to examine changes in students' understanding and application of major ideas in educational psychology. Students' learning was assessed by examining how students' knowledge about various aspects of educational psychology changed over the course. Students' open-ended responses were analyzed within three categories: (1) use of terminology, (2) definition of terminology, and (3) application in real-life situations, which includes skills and know-how to apply major ideas and concepts in educational psychology to real-life problems as reflected on movie clips (Brophy, 2008a; Schraw, 2006). By comparing students' initial responses and

their responses made during the last module, students' knowledge development during the course was explored.

CHAPTER 4

QUANTITATIVE RESULTS

Quantitative datasets including self-report survey responses and final grades were analyzed to examine the effects of providing a rationale for learning on students' motivation and learning. The first part of this section focuses on the influence on students' motivation and the second part focuses on the effect on students' learning. For each part results are organized by the specific hypotheses. Tables 11 and 12 illustrate the descriptive statistics of motivation and learning measures respectively. Table 13 presents correlations among dependent variables.

Motivation

It was hypothesized that the students in the two experimental conditions (student vs. instructor rationales) would show higher gains in their perceived value, interest in the course, self-determination, and autonomous regulation compared to the students in the control condition where no rationale was provided. For each motivational measure that consists of multiple sub-scales (i.e., perceived value, self-determination, & autonomous regulation), a repeated measures multivariate analysis of variance (RM-MANOVA) was used to test the hypotheses. When there was a statistically significant result emerging from the omnibus multivariate tests, separate follow-up univariate tests were conducted. As for students' interest in the course, a repeated measures analysis of variance (RM-ANOVA) was used to test the hypothesis as it only had one dependent variable.

Despite the random assignment of participants to treatments, several students dropped the course making it necessary to examine whether there was any pre-test difference in any of the motivational measures among the three conditions. Results of

ANOVA on each sub-scale of motivational measures indicated that there was no statistically significant difference in most pre-test measures among the three conditions (F-values ranging between 0.33 and 2.81). The only exception was the students' sense of autonomy ($F(2, 53) = 4.25, p < .05$) where the no rationale condition scored the highest, followed by the student and instructor rationale conditions (see Table 13).

A visual inspection of histograms and descriptive data was conducted to check for the assumption of normality. No extreme outliers were observed in both the pre- and post-test measures. Scatter plots of each dependent variable were also examined to check for linearity assumption. None of the scatter plots appeared to show non-linear pattern. Given that both the assumptions of normality and linearity were met, a RM-MANOVA was conducted as planned.

Perceived Value

A RM-MANOVA was performed, with utility value and intrinsic value as the dependent variables. Results showed that the multivariate omnibus for condition (i.e., student rationale vs. instructor rationale vs. control) was non-significant (Wilks' $\lambda = 0.94$, $F(4, 100) = 0.77$, *n.s.*, $\eta^2 = 0.03$), as were condition x time interactions (Wilks' $\lambda = 0.90$, $F(4, 100) = 1.32$, *n.s.*, $\eta^2 = 0.05$). The within-subject tests for time (i.e., pre- vs. post-test) (Wilks' $\lambda = 0.52$, $F(2, 50) = 23.14, p < .001$, $\eta^2 = 0.48$) was significant. However, follow-up univariate F tests on utility value ($F(1, 51) = 0.50$, *n.s.*, $\eta^2 = 0.10$) and intrinsic value ($F(1, 51) = 0.26$, *n.s.*, $\eta^2 = 0.05$) were non-significant. Results suggest

that students' perception of the value of the course neither changed over time nor was affected by the types of rationales to which they listened throughout the course.

Interest in the Course

A RM-ANOVA tested the hypothesis that the students who listened to a rationale for learning would report gains in the interest in the course. Results showed that the main effect of condition (i.e., student rationale vs. instructor rationale vs. control) was non-significant ($F(2, 51) = 0.57$, *n.s.*, $\eta^2 = 0.02$), as were within-subject tests for time (i.e., pre- vs. post-test) ($F(1, 51) = 0.01$, *n.s.*, $\eta^2 = 0.00$), and condition x time interactions ($F(2, 51) = 0.15$, *n.s.*, $\eta^2 = 0.06$). Results suggest that students' interest in the course neither changed over time nor was affected by the types of rationales to which they listened.

Self-Determination

A RM-MANOVA was performed, with sense of competence, sense of autonomy, sense of relatedness to peers, and sense of relatedness to instructors as the dependent variables. Results showed that the multivariate omnibus for condition (i.e., student rationale vs. instructor rationale vs. control) was non-significant (Wilks' $\lambda = 0.80$, $F(8, 96) = 1.45$, *n.s.*, $\eta^2 = 0.10$). The multivariate omnibus for time (i.e., pre- vs. post-test), on the other hand, was significant (Wilks' $\lambda = 0.41$, $F(4, 48) = 16.82$, $p < .001$, $\eta^2 = 0.58$), as were time x condition interactions (Wilks' $\lambda = 0.64$, $F(8, 96) = 2.97$, $p<.01$, $\eta^2 = 0.20$). Follow-up F tests were conducted for each of the four sub-scales of self-determination. Univariate tests showed significant main effect of time for sense of

autonomy ($F(1, 51) = 7.49, p < .05, \eta^2 = 0.13$) showing a post-test gain of 0.07. A significant time x condition interaction effect on the students' sense of relatedness to instructors ($F(2, 51) = 4.96, p < .05, \eta^2 = 0.16$) was also found. The instructor rationale conditions showed gains in their sense of relatedness to instructors by a mean difference of 0.12 over time while the student rationale condition showed loss by a mean difference of 0.05. The mean score for the control condition remained the same over time (see Table 11).

Results suggest that students' sense of autonomy increased over time regardless of the condition to which they were assigned as a result of their course experiences. Findings also suggest that the magnitude of changes in their sense of relatedness to instructors varied depending on the condition to which they were assigned. Students who listened to the instructor rationales reported their sense of relatedness to instructors increased over time while their counterparts who listened to the student rationales reported a decrease in their sense of relatedness to instructors. Students' sense of competence and their sense of relatedness to their peers neither changed over time nor were affected by the source of rationale.

Autonomous Regulation

A RM-MANOVA was performed, with autonomous regulation and controlled regulation as the dependent variables. Results showed that the multivariate omnibus for condition (i.e., student rationale vs. instructor rationale vs. control) was non-significant (Wilks' $\lambda = 0.91, F(8, 84) = 0.51, n.s., \eta^2 = 0.05$), as were condition x time interactions (Wilks' $\lambda = 0.84, F(8, 84) = 0.92, n.s., \eta^2 = 0.08$). The within-subject tests for time (i.e.,

pre-test, Module 3, Module 5, post-test) (Wilks' $\lambda = 0.72$, $F(4, 42) = 3.95$, $p < 0.01$, $\eta^2 = 0.27$) was significant (Wilks' $\lambda = 0.28$, $F(3, 43) = 37.34$, $p < .001$, $\eta^2 = 0.72$). Univariate tests showed a significant main effect of time for autonomous regulation ($F(3, 43) = 38.52$, $p < .05$, $\eta^2 = 0.73$) and controlled regulation ($F(3, 43) = 23.35$, $p < .05$, $\eta^2 = 0.62$). Both students' sense of autonomous regulation and controlled regulation decreased until the end of Module 5 and rebounded at the end of the course (see Table 11).

Learning

It was hypothesized that the students in the two experimental conditions (student vs. instructor rationales) would score higher in the final grades and show higher levels of perceived learning compared to the students in the control condition where no rationale was provided. An initial descriptive analysis suggested that the distribution of final grades was not normally distributed (Skewness: -1.94; Kurtosis: 4.979) (see Table 12). Therefore, the Kruskal Wallis test, which is a non-parametric version of ANOVA, was used to examine the effect of the rationales on students' final grades. For perceived learning, an analysis of variance (ANOVA) was used to test the hypotheses as there was no indicator of violation of normality assumption.

Final Grades

Results showed that there was a statistically significant difference among the three conditions ($\chi^2 = 6.44$, df = 2, $p < .05$). The mean rank for the student rationale condition was the highest (Mean rank = 38.25), followed by the no rationale condition (Mean rank = 27.98), and the instructor rationale condition (Mean rank = 24.97).

Perceived Learning

Results showed that the main effect of condition (i.e., student rationale vs. instructor rationale vs. control) on perceived learning was not significant ($F(2, 56) = 3.58$, $p < .05$, $\eta^2 = 0.11$). The finding suggests that students' perception of their learning did not differ by the source of rationale.

Discussion of Quantitative Results

The quantitative analysis focused on the effects of providing a rationale for learning on students' motivation and learning. For motivation, it was hypothesized that students who listened to either student or instructor rationales would report gains in their perceived value, interest in the course, self-determination, and autonomous regulation.

Results supported two of four hypotheses regarding motivation. First, it was found that students' sense of autonomy improved over time, regardless of source of rationale. In other words, participants in both the student and instructor conditions reported that their sense of autonomy increased over time. Second, it was found that students who listened to instructor rationales reported gains in their sense of relatedness to instructors while those who listened to student rationales reported loss in their sense of relatedness to instructors. These findings were consistent with previous studies that showed the provision of rationales positively influenced students' self-determination (Jang, 2008). While consistent with the literature on instructor rationale, this study' results suggest that rationales may uniquely affect the relatedness to instructors rather than the relatedness to peers.

Results regarding students' perceived value and interest in the course did not support the hypotheses. In other words, students' perception of the value of the course

and their interest in the course neither changed over time nor were affected by the source of rationale that they received throughout the course. This null finding might be attributed to the fact that the course is a teacher education course. A majority of the students stated either that the course was part of their teacher education requirement or that they were interested in pursuing a teaching career. Given the strong practical value of the course, it is plausible that the effect of rationale on learning might be minimal in changing students' perceived value as they already started the semester with clear expectations about the value of the course. The fact that there was no change in students' interest level might also be attributed to the unique nature of the online course which involved various uses of technology and multi-media. It is possible that students in this online course started with high level of interest in the course as they were exposed to a variety of multimedia such as Flash-based games during the first week of the course.

In terms of students' learning, results showed that the source of rationale for learning had different impacts on students' final grades. Students who listened to student rationales performed the highest, followed by students who did not listen to any rationales, and students who listened to instructor rationales throughout the semester. The prior research has shown students who received instructor rationales for learning outperformed the counterparts who received no rationales (Deci & Ryan, 1994; Jang, 2008; Reeve et al., 2002). Therefore, it was a rather unexpected finding that the students who listened to instructor rationales scored lower than the students in the control condition where no rationale was provided. One possible explanation is that students considered their instructors as authoritative figures and consequently perceived their

explanations about the value of the course of controlling and imposing. This could have had a negative impact on students' learning over time.

CHAPTER 5

QUALITATIVE RESULTS

Overview of the Qualitative Data

Two types of qualitative data were collected in this study. The first set of data is students' responses to an open-ended question that they had to answer immediately after listening to rationales. Each time a rationale was provided, the students in the student and instructor rationale conditions were asked to comment briefly on the rationales they heard. Since rationales were only provided in the two experimental conditions (i.e., student and instructor rationale), no data was collected from the control condition, where no rationale was provided. Responses to these open-ended questions, which were given six times throughout the course, were coded and analyzed to examine whether students' responses to the rationales demonstrated different patterns depending on the source of rationale.

The second set of data is students' essay responses to a series of short movie clips that they watched at the beginning and the end of the course. During the first and last week of the semester, students were asked to watch a movie montage that consisted of one to two minute movie clips that contained scenes where various forms of learning took place. For instance, one of the movie clips showed how a young boy learned to play chess masterfully after watching how others play in a park. This particularly scene was included because it was considered a classic example of the type of observational learning which was discussed in the module on social interaction and learning. Details of each movie clip are provided in Appendix E. Once students watched the movie montage, they were asked to write a brief analysis (500 words) on what kinds of learning they observed in the clips. This task was given at the beginning of the course, before students

were exposed to any of the major modules in the course. The same task was given at the end of the course, to see how students were able to make connections between the movie clips and what they learned over the semester. The analysis examined changes in how students understood major concepts in educational psychology and how they applied those ideas to interpret the educational phenomena portrayed in the movie clips.

Students' Immediate Responses

For students in the student and instructor rationale conditions, the following question was presented immediately after they listened to the rationales:

In 25 words or less, please explain why the explanation was helpful or unhelpful.

Since there were six different modules, students in the two experimental conditions had to respond to this question six times. Students' responses were complied together within the experimental condition. For instance, all the comments made by the students who listened to student rationales were collected together. Once all the comments were collected, an inductive analysis of theme was conducted. In other words, emerging themes were identified from the analysis rather than from using pre-determined coding categories. Similarities and differences found in the themes across the two experimental conditions are reported in the following section.

Results

Several interesting findings emerged from the analysis of students' immediate responses. Most students reported that the rationales served as useful introductions to the modules. Regardless of the source of rationale, students thought that listening to them

helped them prepare for the upcoming module. They reported that the rationales provided a brief overview of the module. In addition, participants reported that the rationales helped them understand how the concepts that they were going to learn can be applied to real-life situations. Some of the most common types of responses include:

"The explanation gave examples of how what we are going to learn about Behaviorism in this module will provide us with tools we will use as teachers."

"It was helpful to see what is being taught in the next module and how it is applied to everyday things such as ads."

"It was helpful to hear that what I will learn in this module will be used in other classes."

"I think this information was helpful because I, too, am an athlete and I agree that imitation plays a large part in the learning process."

"It was helpful because it gave examples of how to motivate students in interesting ways."

"I want to teach younger kids, so I have been waiting for a module like this one. I am excited and ready to learn!"

This was consistent with previous studies that showed providing a rationale for learning was effective in promoting students' positive attitudes toward the class. However, despite the consensus on the benefits of listening to the rationales for learning, the comments as to why they were helpful differed significantly across the two conditions.

Student Rationale Condition: Focus on the Source

One unique theme that emerged from the majority of responses collected from the student rationale condition was their sense of relatedness to former students. Several students commented that they found the rationales helpful because they were provided by someone to whom they could relate. Some students mentioned that it was nice to hear from people who have gone through the same path as they would be. Another interesting finding was that students reported strong bonds to the former students, whom they considered as their role models. For instance, students who aspired to become high school mathematics teachers tended to find the rationales provided by a high school mathematics teacher more helpful and engaging. Here are some of the comments pertinent to the source of rationale:

> *"The explanation was helpful. It's reassurance from someone who has taken the course and applied it to her everyday life."*

> *"I found it interesting that Brian was able to apply the information to advertising. It is interesting to think that the class can be useful in professions other than teaching."*

> *"I like how it related to other classes. I am currently taking TE 250 so I felt something like a personal connection."*

> *"I thought this explanation was very helpful. I really liked how she explained how she used the materials in her coaching. It made it seem very practical."*

"I think this was helpful because I want to be a science teacher, and like math, I think it is a subject that may be tricky to get students motivated to learn."

"I liked Rebecca's explanation a lot because it gave me an insight as to how this module can be applied to teaching."

Instructor Rationale Condition: Focus on the Information

A completely different theme emerged from the responses given by the students in the instructor rationale condition. Instead of focusing on who provided the rationales, students in the instruction rationale condition were more concerned with the information provided in the explanations. Some commented that concrete examples of real-life applications made them become more interested in the content of the module. Some complained that too little information was provided regarding what was covered in the actual module. Here are some of the comments pertinent to the information of rationale:

"The explanation was helpful because it helped me focus. When listening to the professors I was able to focus on the actual content."

"The explanation was helpful because it provided a little introduction of memory and provided an example to help us understand what we will be focusing on."

"It introduced the topic well by covering a good chunk of material quickly and peaked my interest on the topic."

"I have already learned about schemas a few years ago, so it was a quick refresher to the course and what I will be learning about more in depth."

"The explanation listed specific interesting points that we will be covering in this section. I'm interested in learning more about modeling!"

"Gave a brief overview of what we'll be learning."

"Made some reference to moral development and how it is linked to overall development."

Given that the content of the rationales were the same both for the student and instructor rationale conditions, it is interesting to see how students in the two conditions responded differently to the same prompts. There are several plausible explanations to account for this difference observed across the two conditions. First, it is possible that there was a novelty effect for the students in the student rationale condition. It is not common to listen to explanations given by former students in the class. Therefore, some students might have paid more attention to the source rather than to the content or information of the rationales. Second, it is also plausible that students are used to the notion that instructors' explanations are part of the lectures and that their explanations should cover the course content more substantially.

Students' Essay Responses

Pre-Test

During the first week of the class, students watched a series of short movie clips that contained educational scenes. After they watched the movie montage, they were asked to write short essay responses to the following prompt, and post them on the course discussion forum.

You've just watched the montage of video clips. If you need to see those clips again to help you with this part at any time, just click here. Otherwise, in about 500 words, make a posting that answers these questions:

What are different ways that people learned in these movies?
What evidence could you see in the movies that people were learning?
What are factors that helped or hindered people from learning?

The essay assignment was aimed at measuring students' prior knowledge in educational psychology. In other words, students' responses represented how much students knew about big ideas and concepts in educational psychology and how well they were able to apply those concepts to real-life situations.

As a pre-test, the essay was a vital part of this learning measure as it captured students' prior knowledge about major concepts and ideas covered in the course. Some students started the course with strong backgrounds in education and psychology, while others had never taken courses in education or psychology before. Therefore, it was important to collect data that showed their initial understanding of educational psychology.

Post-Test

At the end of the semester, after students learned all the major learning theories, they were asked to watch the same movie montage and respond to the same essay prompt that was given at the beginning of the course. This time, the course instructors made their initial postings invisible so that they could not just copy and paste their initial responses.

Students' essay responses, which were collected at the beginning and end of the course, were analyzed qualitatively using the analysis framework provided in Table 14. The coder conducted blind-coding where the information about whether the response was a pre- or post-test measure was omitted. The analysis focused on examining the three categories of evidence of knowledge: ***use of terminology, definition of terminology, and applications in real-life***. The total number of indicators that fall into these three categories of evidence of knowledge for both the pre- and post-responses of participants were counted (see Table 15).

To establish the reliability of coding, an interrater reliability analysis using Kappa statistic was conducted on twenty randomly selected partial responses. Cohen's kappa was approximately 0.70 ($p < .001$) which indicated that the coding was substantially reliable (Landis & Koch, 1977).

Since the analysis focused on how students' knowledge changed over time, an analysis of covariance (ANCOVA) with pre-test scores as covariate was conducted on the three categories.

Results

Use of Terminology

The number of indicators of appropriate usage of terminologies covered in the course was tallied for both the pre- and post-test responses. Results of ANCOVA indicated that even after adjusting for pre-test responses, students' use of terminology did not statistically differ by conditions ($F(2, 52) = 0.19$, *n.s.*). In other words, there was no difference in students' use of terminology among the three rationale conditions when pre-test differences were controlled for.

Definition of Terminology

The number of indicators of accurate definition of terminologies covered in the course was tallied for both the pre- and post-test responses. Results of ANCOVA indicated that even after adjusting for pre-test responses, students' use of terminology did not statistically differ by conditions ($F(2, 52) = 1.66$, *n.s.*). In other words, there was no difference in students' definition of terminology among the three rationale conditions when pre-test differences were controlled for.

Applications in Real-Life

The number of indicators of application of concepts covered in the course in real-life was tallied for both the pre- and post-test responses. Results of ANCOVA indicated that after adjusting for pre-test responses, students' application in real-life statistically differed by conditions ($F(2, 52) = 3.20, p < .05$). In other words, there was difference in students' application of real-life among the three rationale conditions when pre-test differences were controlled for. The student rationale condition showed the biggest improvements, followed by the no rationale condition and the instructor rationale (see Table 15). This was consistent with the results of the quantitative analysis on students' final grades.

Discussion of Qualitative Results

Some of the qualitative results that examined students' knowledge development were consistent with the quantitative results. That is, students who listened to student rationales at the beginning of each module showed the most improvements in their abilities to apply concepts to real-life problems. The next condition that showed the most improvements was the control condition in which no rationales for learning were

provided. Finally only a small percentage of students who listened to instructor rationales showed improvements in application of concepts in real-life. It was notable that the same pattern was observed in students' final grades. The student rationale condition performed the best, followed by the control condition and the instructor rationale condition.

Results from the qualitative analysis provide another piece of evidence that listening to former students' explanations about the module had a positive effect on students' learning. It was consistent with the findings that showed a significant effect on students' final grades. Given that the major objectives of educational psychology are to help pre-service teachers better understand and apply the complex psychological processes of learning and science, changes in students' abilities to apply those to real-life problems represent improvements in students' learning.

CHAPTER 6

DISCUSSION

The purpose of this study was to examine the effect of providing a rationale for learning a lesson on students' motivation and learning in the context of an online educational psychology course. Specifically, the study explored the effects of student and instructor rationales which provided verbal explanations about the value of the lesson. Rationales were given six times throughout a semester and both quantitative and qualitative data on students' motivation and learning were collected.

For motivation, results did not support the hypotheses that students' perception of value of the course and their interest would increase after listening to rationales. Findings, however, supported two out of four hypotheses. First, results showed that students' sense of autonomy (i.e., the perception of control over their own actions) increased over time with both rationale conditions in contrast to no rationale condition. Second, results also showed that students who listened to instructor rationales reported gains in their sense of relatedness to instructors while students who listened to student rationales reported a decrease in their sense of relatedness to instructors.

For learning, results showed that the source of rationale had different effects on students' final grades and development of knowledge, which includes use of terminology, definition of terminology, and application of concepts and ideas in real-life problems, in educational psychology. Results of both quantitative and qualitative analyses suggest that student rationale condition demonstrated the highest level of learning, followed by no rationale condition. Students in the instructor rationale condition performed had the

lowest scores on the learning measures. No significant group difference was observed in students' perceived learning across the three conditions.

Limitations

There are several limitations to this study. First, the final sample size was relatively small which yielded weak power. A priori power calculation based on the effect sizes reported in Jang's study (2008) suggested that a sample size of eighty would yield a strong power. Unfortunately, several students in each condition dropped out the course and as a result the final sample size became fifty-nine which eventually hurt the power of this study. Another potential issue was the unequal sample size of each condition. Since there were four sections of the course, two sections had to be assigned to be assigned to the same condition. In this study two sections were assigned to the no rationale condition and as a result it became an unbalanced design. This was unavoidable as the study was conducted within the context of a real undergraduate course.

Since the experiment was conducted on a fifteen-week online course, it was also exposed to various threats that could have weakened its internal validity. Internal validity refers to the validity of inferences about cause-effect relations (Thorndike, 2005). It addresses the questions of "Did the treatments in the experiment indeed cause the specific experimental instance?" (Campbell & Stanley, 1963). There were several confounding variables that might have affected the internal validity of this study. First, students' prior attitudes regarding the content covered in each module could have had an impact on students' motivation and learning. Although the format of rationales was kept consistent throughout the semester, the content that was covered in each module was not the same. Students might have had different background knowledge about, interest in, and attitudes

towards different content even before they start the course. For instance, students may have had negative attitudes towards behaviorism, but more positive attitudes towards the topic of social interaction prior to taking the course.

Future Research

The current study was one of the first experiments where rationales for learning a lesson were provided throughout a semester in an online learning environment. A replicate study conducted in a semester-long face-to-face undergraduate course may be necessary to demonstrate that explaining to students why they need to learn a particular lesson has a positive influence on students' motivation and learning whether delivered face-to-face or online. In addition, a follow-up study conducted in an intact course that is taught by a single instructor can also help us understand the effects of rationales on students' motivation and learning more clearly.

Another research topic that needs to be further investigated is "when and how many times should we provide rationales for learning?" In this study, rationales were provided multiple times at the beginning of each major module. Although this approach is desirable in the sense that students should be exposed to various kinds of rationales, in some cases, it may not be plausible to develop and provide a specific rationale for each lesson taught in the course. To find out what the most effective way is provide a rationale for learning, we need to test the effects of frequency and timing of the provision of the rationales. For instance future studies should examine whether providing a rationale for learning multiple times throughout the course is more effective than providing it once at the very beginning of the course.

Finally, we need to investigate whether providing a rationale for learning is effective in improving students' learning and motivation when it is given in a course where its value is less intuitive to appreciate. An introductory educational psychology course, which was the context of this study, is specifically designed to help students understand the underlying psychological processes of learning and teaching. It is also a requirement for teacher education majors to complete their degrees. Therefore, the value of the course is relatively straightforward. However, there are some courses in which their values are harder to appreciate. For instance, students taking a course on Western philosophy may not fully understand the value of what they learn in the class.

Implications

The study contributes to the research literature in several ways. From a theoretical perspective, findings from this study add to the existing body of research in providing a rationale as a strategy to promote students' motivation and learning. Unlike the previous studies in which an contrived learning task was provided for a short period of time, this study examines changes in students' motivation and learning in an actual semester-long class. Results of this study help us understand whether providing a rationale for learning on a regular basis throughout the course promotes students' motivation and learning. The study also attempts to determine which strategy is the most effective in changing students' perceptions about the course and the value of the lessons.

Another contribution this study makes to the field is in its emphasis on exploring the learning aspects of provisions of rationales. The previous rationale studies either relied on weak measures (e.g., multiple choice quiz items) or lacked pre-test measures to assess students' prior knowledge (Jang, 2008; Reeve et al., 2002). To address these issues

several learning measures were collected in this study: total points accumulated throughout the semester, open-ended responses to movie clips from the first and last module, and a self-report perceived learning questionnaire. By triangulating different learning outcome measures, a better understanding of what kind of impact providing a rationale has on students' learning has been achieved.

Most studies on providing a rationale were conducted in traditional classroom settings. This study applied a motivation theory to online learning environments. Whether face-to-face or online, instructors are often concerned about how to help their students appreciate the value of a course. Grounded within value and self-determination theories, the study explores the potential implications of existing motivational perspectives in online learning environments. Considering the increasing number of undergraduate courses offered online, more scientific studies of motivation in this context should be conducted.

Finally, from an instructional perspective, the design of this study demonstrates how research grounded in theory can be conducted with strong ecological validity when implemented in regular online courses. Unlike other studies where inauthentic tasks were given, this project was done in a natural academic setting. In addition, the treatments that were developed for this study can easily be implemented in actual teaching practices (e.g., a testimonial of a former student or a verbal statement by the instructor). To the degree that researchers design interventions such as the one used in the present study, the "pedagogical validity" of their research will be increased. Rather than testing hypotheses in contrived settings in the hope that the results of this research will later be implemented in practice, researchers whose designs use pedagogically sound interventions will

increase the likely impact of their research on practice. Online environments provide an especially accessible mode of instruction for such researchable systematic design interventions.

Table 1.

Participants' grade levels by conditions

Rational Condition	Grade						Total
	Freshmen	Sophomore	Junior	Senior	Post BA	Other	
Student	1	4	4	5	2	0	16
Instructor	1	4	6	3	0	1	15
No	0	7	11	8	0	2	28
Total	2	15	21	16	2	3	59

Table 2.

Degree requirement by conditions

Rationale Condition	Is TE 150 a requirement?			Total
	No	Uncertain	Yes	
Student	3	3	10	16
Instructor	7	1	7	15
No	11	3	14	28
Total	21	7	31	59

Table 3.

Participants' desire to pursue teaching careers

Rationale Condition	Are you planning to pursue a teaching career?			Total
	No	Uncertain	Yes	
Student	3	1	12	16
Instructor	3	4	8	15
No	5	7	16	28
Total	11	12	36	59

Table 4.

Participants' online learning experiences by conditions

Rationale Condition	How many online courses have you taken before?					Total
	0	1	2	3	4 or more	
Student	8	2	2	0	3	16
Instructor	6	2	1	3	4	15
No	13	6	6	2	1	28
Total	27	10	9	5	8	59

Table 5.

Initial familiarity with the topics

Rationale Condition	Initial Familiarity with the Topics					
	Student		Instructor		No	
	M	*SD*	*M*	*SD*	*M*	*SD*
Behaviorism	3.69	1.50	4.14	1.92	4.65	1.38
Memory	4.31	1.45	5.36	1.00	5.04	1.15
Schemas	3.25	1.77	3.86	1.46	3.81	1.74
Social Interaction	5.00	1.21	5.79	0.89	5.12	1.28
Motivation	4.75	1.18	5.57	1.22	5.15	1.22
Development	4.25	1.34	5.29	1.27	5.15	1.46

Table 6.

Initial interest in the topics

Rationale Condition	Initial Interest in the Topics					
	Student		Instructor		Control	
	M	*SD*	*M*	*SD*	*M*	*SD*
Behaviorism	5.56	1.09	5.79	1.19	6.12	1.07
Memory	5.38	1.09	6.00	1.18	6.31	0.93
Schemas	5.44	1.09	5.43	1.28	5.62	1.55
Social Interaction	6.13	0.89	6.50	0.86	6.42	0.86
Motivation	6.19	0.66	6.43	0.85	6.42	0.81
Development	5.94	0.99	6.07	1.14	6.58	0.70

Table 7.

A priori power analysis (N=66) using effect sizes reported in Jang (2008)

Variable	*d*	*r*	*f*	Power (1-β)
Perceived Autonomy	0.55	.27	0.28	0.63
Perceived Importance	0.71	.33	0.35	0.91
Essay	0.56	.27	0.28	0.63
Checklist	0.42	.21	0.21	0.63
Conceptual Learning	0.39	.19	0.19	0.41
Engagement (Time 1)	0.44	.21	0.21	0.63
Engagement (Time 2)	0.64	.30	0.31	0.83

Table 8.

Six role models that represent the former students

Module	Gender	Grade Level	Subject	Role	Topic
Behaviorism	Female	Elementary	N/A	Teacher	Classroom Management
Memory	Male	N/A	N/A	Advertising	Cognitive Load
Schemas	Female	N/A	N/A	TE Major	TE 250
Social Interaction	Female	Elementary	Sports	Coach	Modeling
Motivation	Male	High School	Mathematics	Teacher	Self-Concept
Development	Female	Kindergarten	N/A	Teacher	State-Appropriate

Table 9.

Example of a script of a student rationale (Module 2)

Component	Example
Greetings	Hi, fellow TE 150ers!
Introducing him/herself: first name, current position (grade level, subject-matter, location of the school), and when and why he/she took the course	My name is Andrea and I am currently an elementary teacher in Grand Rapids. I took this course in 2007 as a requirement in the Teacher Education department.
Brief explanations about the module	In this module I learned about a learning theory called behaviorism.
Emphasis on intrinsic value	As I read through the articles and websites about praise, punishment, and rewards, I became fascinated with how our life is affected by behaviorism.
Emphasis on utility value	As an elementary teacher, I have often used behavioral techniques to manage my students. For example, I would use clapping or whistling to quickly get my students' attention so that they can move onto a new task. Another aspect that I found useful in this module was the notion that praising can be harmful. Nowadays I try hard to give my kids praise for their effort and creativity and not for their "smartness." What I learned in this module helped me become reflective about when and how I should provide rewards and punishments to my kids.
Concluding remarks	I hope you enjoy this module as much as I did and have fun!

Table 10.

Example of a script of an instructor rationale (Module 2)

Component	Example
Introduction	Hello, this is your faculty instructor ***A*** and ***B***.
Brief explanation about the module	In this module you will learn about a learning theory called behaviorism.
Emphasis on intrinsic value	After reading the articles and websites about praise, punishment, and rewards, you will be fascinated with how your life is affected by behaviorism.
Emphasis on utility value	When you become a teacher you will probably use various behavioral techniques to manage your students. For example, if you are an elementary teacher, you may use clapping or whistling to quickly get your students' attention so that they can move onto a new task. Students from the past semesters also found the notion that praising can be harmful "mind-boggling." When you teach your students, be sure to give them praise for their effort and creativity and not for their "smartness." What you learn in this module will help you become reflective about when and how you should provide rewards and punishments to your kids.
Concluding remarks	We hope you enjoy this module and have fun!

Table 11.

Descriptive statistics of motivation measures

Dependent Variable	Sub-Constructs		Student Rationale *M (SD)*	Instructor Rationale *M (SD)*	No Rationale *M (SD)*
Perceived Value	Utility Value	Pre-	0.86 (0.12)	0.82 (0.15)	0.89 (0.12)
		Post-	0.88 (0.10)	0.81 (0.13)	0.85 (0.13)
	Intrinsic Value	Pre-	0.71 (0.17)	0.75 (0.14)	0.80 (0.14)
		Post-	0.72 (0.19)	0.74 (0.18)	0.75 (0.17)
Interest in the Course		Pre-	0.75 (0.20)	0.81 (0.12)	0.80 (0.12)
		Post-	0.75 (0.18)	0.79 (0.15)	0.76 (0.17)
Self-Determination	Competence	Pre-	0.88 (0.12)	0.89 (0.14)	0.86 (0.12)
		Post-	0.87 (0.11)	0.91 (0.09)	0.87 (0.10)
	Autonomy	Pre-	0.72 (0.13)	0.65 (0.19)	0.80 (0.19)
		Post-	0.81 (0.19)	0.74 (0.23)	0.78 (0.21)
	Relatedness	Pre-	0.66 (0.13)	0.70 (0.14)	0.70 (0.14)
	- Peers	Post-	0.72 (0.18)	0.72 (0.23)	0.66 (0.20)
	Relatedness	Pre-	0.66 (0.13)	0.66 (0.14)	0.75 (0.14)
	- Instructor	Post-	0.60 (0.18)	0.78 (0.15)	0.74 (0.18)
Autonomous Regulation	Autonomous Regulation	Pre-	0.90 (0.13)	0.84 (0.12)	0.89 (0.10)
		M3	0.77 (0.20)	0.68 (0.15)	0.72 (0.22)
		M5	0.65 (0.22)	0.59 (0.07)	0.65 (0.15)
		Post-	0.84 (0.17)	0.83 (0.08)	0.83 (0.16)
	Controlled Regulation	Pre-	0.90 (0.12)	0.90 (0.10)	0.95 (0.09)
		M3	0.79 (0.21)	0.72 (0.20)	0.74 (0.24)
		M5	0.74 (0.23)	0.64 (0.14)	0.75 (0.17)
		Post-	0.89 (0.12)	0.84 (0.16)	0.89 (0.13)

Table 12.

Descriptive statistics of post-test learning measures

	Rationale Condition	Student	Instructor	No
Dependent Variable		*M (SD)*	*M (SD)*	*M (SD)*
Final Grades		91.88 (3.86)	85.84 (9.44)	90.10 (5.73)
Perceived Learning		0.75 (0.14)	0.76 (0.16)	0.73 (0.14)

Table 13.

Correlations among dependent variables

	Pre Util	Post Util	Pre Intr	Post Intr	Pre In	Post In	Pre Co	Post Co	Pre Au	Post Au	Pre RP	Post RP	Pre RI	Post RI	Pre AR	Post AR	Pre CR	Post CR
Pre Util	1																	
Post Util	.79**	1																
Pre Intr	.59**	.46**	1															
Post Intr	.45**	.59**	.60**	1														
Pre In	.46**	.43**	.76**	.64**	1													
Post In	.36**	.59**	.53**	.88**	.66**	1												
Pre Co	.34**	.30*	.42**	.40**	.55**	.46**	1											
Post Co	.27*	.46**	.40**	.48**	.58**	.56**	.53**	1										
Pre Au	.48**	.39**	.62**	.56**	.56**	.52**	.50**	.25	1									
Post Au	.35**	.48**	.39**	.72**	.56**	.72**	.54**	.67**	.54**	1								
Pre RP	.28*	.26	.37**	.32*	.38**	.24	.27*	.14	.37**	.20	1							
Post RP	.11	.45**	.30*	.56**	.35**	.49**	.34*	.44**	.26	.51**	.46**	1						
Pre RI	.36**	.15	.49**	.33*	.44**	.31*	.25	.19	.55**	.30*	.34*	.04	1					
Post RI	.14	.11	.36**	.45**	.40**	.39**	.18	.30*	.31*	.35**	.29*	.20	.49**	1				
Pre AR	.55**	.51**	.60**	.53**	.60**	.49**	.66**	.44**	.50**	.54**	.32*	.31*	.38**	.17	1			

Table 13.

(Continued)

Post AR	.43**	.65**	.44**	.54**	.52**	.63**	.39**	.42**	.29*	.48**	.22	.29*	.05	.23	.43**	1	
Pre CR	.43**	.31*	.49**	.34*	.43**	.33*	.38**	.33*	.19	.20	.13	.04	.26*	.27*	.56**	.30*	1
Post CR	.06	.18	.17	.22	.22	.29*	.09	.20	.06	.14	-.08	-.01	.02	.22	-.03	.45**	.31*	1

Table 14.

Analysis framework: Evidence of knowledge

Categories	Definitions	Indicators	Examples
Use of terminology	Using terms that are relevant to course content	A vocabulary used in the course	"It is important for teachers to recognize the learning styles of their students"
Definition of terminology	Defining terms in their own words	Definition or explanation of a vocabulary used in the course	"ZPD is an idea that consists of two ideas. One, you begin to..."
Application in real-life	Applying major ideas and concepts to interpret the educational phenomenon depicted in the movie montage	Interpretation of the movie scenes based on the ideas discussed in the course	"It reminds me of the locus of control topic we learned about a few modules back. By having..."

Table 15.

Descriptive statistics of knowledge development

Knowledge Development	Categories		Student Rationale (N = 15)	Instructor Rationale (N = 13)	No Rationale (N = 28)
			M (SD)	*M (SD)*	*M (SD)*
	Use of Terminology	Pre-	4.47 (1.96)	3.92 (2.10)	3.61 (1.87)
		Post-	7.53 (2.83)	6.69 (3.15)	7.04 (3.16)
	Definition of Terminology	Pre-	0.07 (0.26)	0.08 (0.28)	0.04 (0.19)
		Post-	0.80 (1.01)	0.92 (1.11)	0.43 (0.69)
	Application in Real-Life	Pre-	1.60 (1.06)	1.23 (0.93)	2.21 (1.10)
		Post-	4.33 (1.40)	2.77 (1.17)	4.25 (1.71)

APPENDICES

APPENDIX A: MOTIVATION MEASURES

A.1. Motivation Measures

Please read the following statements carefully and indicate your agreement with each of the items on a 1 (strongly disagree) to 7 (strongly agree) scale.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

Perceived Value (8 items)

What I am learning in this class is relevant to my life	1	2	3	4	5	6	7
The topics in this class are important for my career	1	2	3	4	5	6	7
I think that taking this course is useful for developing the key skills I need to advance my career	1	2	3	4	5	6	7
I think this class is important because its ideas and concepts can used in other courses	1	2	3	4	5	6	7
The content in this class is intriguing	1	2	3	4	5	6	7
The activities in the course are fun to do	1	2	3	4	5	6	7
When I am engaged in an activity in the course, I think about how much I enjoy it	1	2	3	4	5	6	7
I enjoy reading course materials	1	2	3	4	5	6	7

Interest (4 items)

I think what I learn in this course is very interesting	1	2	3	4	5	6	7
I enjoy taking this course very much	1	2	3	4	5	6	7
* *I would like to take more courses about learning*	1	2	3	4	5	6	7
* *My experience in this course has made me want to take more courses about learning*	1	2	3	4	5	6	7

Self-Determination (10 items)

I feel confident in my ability to learn the course materials	1	2	3	4	5	6	7
I am capable of learning the material in this course	1	2	3	4	5	6	7
I am able to achieve my goals in this course	1	2	3	4	5	6	7
I feel able to meet the challenge of performing well in this course	1	2	3	4	5	6	7

During the course I felt I was doing what I wanted to be doing	1	2	3	4	5	6	7
I felt I had control to decide what to do and whether to do it	1	2	3	4	5	6	7
I would like a chance to interact with my classmates more often	1	2	3	4	5	6	7
It is likely that my classmates and I could become friends if we interacted a lot	1	2	3	4	5	6	7
I felt like I could really count on my instructor(s)	1	2	3	4	5	6	7
I feel close to my instructor(s)	1	2	3	4	5	6	7
Autonomous Regulation (4 items): I participate actively in the course because:							
I feel like it is a good way to improve my understanding of the material	1	2	3	4	5	6	7
a solid understanding of the materials that are covered in this course is important to my intellectual growth	1	2	3	4	5	6	7
I will feel proud of myself if I do well in this course *(R)*	1	2	3	4	5	6	7
a good grade in this course will look positive on my record *(R)*	1	2	3	4	5	6	7

** : Items that have been added to the interest measures in the post-test*
(R): Items that need to be reverse coded

APPENDIX B: LEARNING MEASURES

B.1. Perceived Learning

***Perceived Learning (3 items): On a scale of 1 to 7,*	
How much did you learn in this course, with 1 meaning you learned nothing and 7 meaning you learned more than in any other course you've had?	1 2 3 4 5 6 7
How much do you think you could have learned in this course if it had been a traditional face-to-face course that met regularly in a classroom, with 1 meaning you learned nothing and 7 meaning you learned more than in any other course you've had?	1 2 3 4 5 6 7
How much do you think you could have learned in this course if you had the ideal instructor, with 1 meaning you learned nothing and 7 meaning you learned more than in any other course you've had?	1 2 3 4 5 6 7

B.2. Knowledge Development

1. Pre-Test Question (presented in module 1)

You've just watched the montage of video clips. If you need to see those clips again to help you with this part at any time, just click here. Otherwise, in about 500 words, make a posting that answers these questions:

- What are different ways that people learned in these movies?
- What evidence could you see in the movies that people were learning?
- What are factors that helped or hindered people from learning?"

2. Post-Test Question (presented in module 8)

Do you remember the video montage we saw at the very beginning of this class? What we would like you to do is revisit this video and review it carefully. After watching the video you will be asked to write a 500 word response on what you see. More specifically, you will be asked to answer the following questions:

- What are different ways that people learned in these movies?
- What evidence could you see in the movies that people were learning?

- What are factors that helped or hindered people from learning?"

Remember to try and make connections to all the ideas and topics we have covered (you are free to browse through the previous modules to refresh your memory). All the previous modules are available for review, with one exception. You will not be able to access what you had written the first time you had viewed the montage. We will make this available in due time. Use as many details as you can in your answer. You may have to watch the montage more than once.

APPENDIX C: BACKGROUND INFORMATION

C.1. Background Information

Background Information (8 items)						
What is your major?						
What is your minor (if applicable)?						
What is your gender?		Female			Male	
In what year were you born?						
What is your grade level?	Freshman	Sophomore	Junior	Senior	Post BA	Other
Is TE 150 a requirement for you?		Yes			No	
Are you interested in becoming a teacher?		Yes			No	
How many online courses have you taken before?						

Please read the following statements carefully and indicate your agreement with each of the items on a 1 (strongly disagree) to 7 (strongly agree) scale.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

Familiarity and Interest in the Course Content (12 items)							
I am familiar with the concepts and ideas of ***behaviorism***	1	2	3	4	5	6	7
I am interested in learning about ***behaviorism***	1	2	3	4	5	6	7
I am familiar with the concepts and ideas of ***memory***	1	2	3	4	5	6	7
I am interested in learning about ***memory***	1	2	3	4	5	6	7
I am familiar with the concepts and ideas of ***schemas***	1	2	3	4	5	6	7
I am interested in learning about ***schemas***	1	2	3	4	5	6	7
I am familiar with the concepts and ideas of social ***interaction***	1	2	3	4	5	6	7
I am interested in learning about social ***interaction***	1	2	3	4	5	6	7
I am familiar with the concepts and ideas of ***motivation***	1	2	3	4	5	6	7

I am interested in learning about ***motivation***	1	2	3	4	5	6	7
I am familiar with the concepts and ideas of ***development***	1	2	3	4	5	6	7
I am interested in learning about ***development***	1	2	3	4	5	6	7

APPENDIX D: REFLECTION ITEMS

D.1. Reflection Items

Please read the following statements carefully and indicate your agreement with each of the items on a 1 (strongly disagree) to 7 (strongly agree) scale.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

Reflections (3 items)
: After listening to the explanation

I became more interested in this ***module*** than I was before	1	2	3	4	5	6	7
I became more interested in this ***course*** than I was before	1	2	3	4	5	6	7

In 25 words or less, please explain why the explanation was helpful or unhelpful

APPENDIX E: TRANSCRIPTION OF MOVIE MONTAGE

E.1. Transcription of Movie Montage

[man climbs to stand on desk]
Why do I stand up here? Anybody.
To feel taller
No. [rings bell] Thank you for playing, Mr. Dalton. I stand upon my desk to remind myself that we must constantly look at things in a different way. [turns to look around room] See, the world looks very different from up here. You don't believe me? Come see for yourselves. Come on. Come on [students walk toward front of room] Just when you think you know something, you have to look at it in another way. Even though it may seem silly or wrong, you must try

[change of scene; Matrix]
1: Now, supposed to start with these operation programs first. ___ Let's do something a little more fun. How about combat training? [loads disk into machine]
2: Jujitsu? I'm going to learn jujitsu?
[1 types on keyboard; 2 begins to convulse, opens eyes]
2: Holy shit.
1: Hey, Mikey, I think he likes it. How about some more?
2: Hell, yes. Hell, yeah.
[computer screen, third man enters]
[looking through window]
3: How is he?
1: Ten hours straight. He's a machine
2: I know kung fu. [end]

[change scene, Bobby Fisher Sequence]
W: Come on, Josh. Let's go.
M1: That the best you got? You ain't got nothing. You sure this game? Maybe we go on down to Chinatown.

M2: No. That ain't it. Hm, that ain't it either. That's

[boy watches two men who are playing cards]

(inaudible) No, you got to take her out of here. You got to leave with that. What you want, to trade queens? You can't trade queens with me. I ain't in the trading business. What I look like, a merchant to you? What you trying to do?

Back up, check this out before you wreck yourself. You can't have it. Hello. See that. Run. That's right, run. [chessboard shown] Run. Run. Somebody call the police. The man is loitering.

[change of scene - boy plays with palace & figurines]

[change of scene – boy sits down and plays chess with older man]

B: Check

[woman and men watch]

[older man grumbles inaudibly, moves chess pieces, boy moves chess pieces]

M3: Nyet, nyet. It's over. You lose.

B: [looks around] Thanks.

M1: what's his name?

B: Josh

M1: Josh what?

W: Let's go, Josh. Don't tell him your last name

M1: Potts, I used to watch you play in the park like Bobby Fisher used to show him this [points to newspaper]

W: Come on

M1: Your boy uses pieces in combination to attack, lady.

That's what I'm talking about, make him run. Got me in trouble. I'm on the run. What can I do? Where can I go? Come on.

[group of men watching]

Young Fisher

Come after me, come after me. There you go. Outstanding.

[repeats Bobby Fisher clip]

M: [man knocks chess pieces to floor, boy and man both look at empty chessboard]

B: Knight to C8.

M: Yes. [man smiles, reaches into briefcase and withdraws a pad of paper, places sticker in pad] It's a mysterious and powerful thing. It's only been given out, I don't know, a few times in history and then only to those who achieve a lot of master class points. Then there's a big ceremony and so on.

B: How do you get master class points?

M: You earn them.

[scene change]

To fully understand poetry, we must first be fluent with its meter, rhyme, figures of speech then ask two questions. One, how artfully has the objective of the poem been rendered and two, how important is that objective? Question one rates the poem's perfection, question two rates its importance. And once these questions have been answered, determining the poem's greatness becomes a relatively simple matter. If a poem's score for perfection is plotted on the horizontal of a graph, and its importance is plotted on the vertical, then calculating the total area of the poem yields the measure of its greatness. As you proceed through the poetry in this book, practice this rating method. As your ability to evaluate poems in this manner grows, so will, so will your enjoyment and understanding of poetry.

Excrement. That's what I think of J. Edgar Prichard. Rip out that page. Rip out the entire page. You heard me. Rip it out. Rip it out. Go on, rip it out.

[student rips out paper]

Thank you, Mr. Dalton. Gentlemen, tell you what. Don't just tear out that page, tear out the entire introduction. I want it gone, history. Leave nothing of it. Rip it out. Rip it out. Be gone, J. Edgar Prichard, Ph.D.. Rip, rip, tear, rip it out. I want to hear nothing but ripping of Mr. Prichard. We'll perforate it, put it on a roll. Armies of academics going forward, measuring poetry.. No, we will not have that here. No more of J. Edgar Prichard. In my class, you will learn to think for yourselves again. You will learn to savor words and language. No matter what anybody tells you, words and ideas can change the world.

[change to spellbound]

Mrs. Slaughter, what if I don't win? And I said so you don't win. You know, you're already, you've, you've won. So you don't spell the right word. Okay. I said then you don't have to study for the next month. She said, yeah, you know how she is. Yeah.

[scene change]

I have been waiting for tomorrow, for that day, I've been waiting for it forever.

All year

All year. And it's, I can finally say tomorrow is the regional spelling bee. I can finally say that.

[scene change-Nupur]

[sitting near computer; taking notes in notepad]

My parents were very pressured to succeed especially in India because academics there are taken very, very seriously.

Parag: She always liked big words for some reason. Yeah, the bigger the word, the better she liked it.

Meena: She would say things like I don't have any opportunities when she had no idea what opportunity meant but she would always liked the sounds. So __ 2 ½ and she had no opportunities. Munchausen

N: Oh, Munchausen syndrome. M U N C H A U S E N.

[scene change]

Spelling is kinda just like I do it because, I don't know, my competitive side kinda comes out. I don't love spelling. I do it cuz I wanta compete, I wanta say hey, look at me, I'm good at this. Cuz I ride with people who are better than me and I sing with people who are better than me

[scene change]

I go higher, my goals go higher also. And so I just gotta keep on reaching, keep on reaching. So this year, I rose above all of my problems and I went straight through the local, straight through the regional. I was determined that I was going to city wide spelling bee. I told the photographer, he was like so what are you going to do when you get to city wide? I said I'm going to win. And sure I did. I won city wide spelling bee. Now, I'm going to the nationals.

[scene change]

Darshana: We were close but this was like a crisis and we all had to pitch in to help whichever way we could. If I could help him pull his clothes out and make sure that they're ready for him, he can shower and he can save two minutes, that also was important. When you fight in a war, everybody has the same goal.

[boy is doing push-ups; scene change—man in chair, boy at desk]

I want you to step back, take a deep breath and use your technique again. Repronounce the word, please, for me. What are you trying to spell?

Neil: S A D E R.

Great, Neil. Not missing a single word. __ I'll be the first one to admit it is hard but what is, what is valuable in life that is easy to achieve? Nothing [end]

[scene change—Washington Heights. 8 weeks until competition]

What can you tell me about a fox?

A fox look like a dog but it's like a dangerous dog that lives in the woods.

Yeah? Okay.

He go quietly and then he jump on the chicken.

Right. Very good. The fox sneaks up. He's quiet, right? So that's what, how we're gonna dance this dance. We're gonna be, we're gonna be smooth, we're gonna be sneaky. We're gonna be quiet when we do a Foxtrot. Okay?

[students dance in twos]

5,6,7,8. Slow, slow, quick, quick, slow. Slow, away. Slow, slow

What do you do at the end of a dance?

You bow

You turn to the lady and give a little bow, right?

[students dancing; text on screen translates teacher talk: "Why are you laughing? Everything you're doing is ugly." Students continue dancing]

Teacher: Everything is my fault?

[Translation of teacher's talk: "You're just laughing. You're not doing anything else."]

Step and _. Michael, that was terrible. Last year, we won gold but there was one final competition that involved a huge, huge giant trophy and we didn't get it. But this year, I

want that trophy. It's like Susan Lucci, I want that Emmy. I want that trophy. Even if it's once and that's it. Just one time and that's it. I won't bother you anymore.

6,7, go. T A N G O. T A, again. T A N G O.

Backwards. T A N G again. Tango face. A N G O. T A N G O.

Make believe, everyone, when you're doing tango, you're imitating (inaudible) very, very sneaky way.

[scene change—kids are outside]

S: Okay, my turn.

[third child comes into view, starts dancing]

[two children dancing]

S: T A N G O

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