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Graduate Students' Intrinsic Motivation in Fully Online Courses

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ABSTRACT: *Despite the emerging research regarding online learning, little attention has been given to students' intrinsic motivation in online courses. Therefore, this research was conducted to determine the level of students' intrinsic motivation in fully-online courses environment. (IMeL) questionnaire with 127 graduate level participants was used to answer the research questions which are (1) What is the level of graduate students' intrinsic motivation in fully online courses? (2) Is there a significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of: (gender, registration status, employment status, and experience with fully online courses)? Findings revealed that graduate students had high level of intrinsic of motivation in online courses environment. The study found that there is a statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of gender. It was also found that there are no statistically significant differences in the level of graduate students' intrinsic motivation in fully online courses in terms of registration status, employment status, and experience with fully online courses. More future qualitative method research is needed in order to understand the nature of intrinsic motivation in online learning environment profoundly.*

KEYWORDS*:* online learning, intrinsic motivation, graduate students

INTRODUCTION

Since the dawn of time, humans have developed tools and technology to assist in the pursuit of our goals. Today, technological advances are rapidly making it possible to automate much of the work currently carried out by humans in different fields in our lives. While the digital technologies are affecting the way we interact with each other and the world around

us, education is no less affected by this rapid growth of technologies. The development of the internet and related technologies has resulted in the merging of online teaching and learning into the routine practices of higher education institutions (Haythornthwaite & Andrews 2011).

Furthermore, the rapid growth of technology has caused an explosion in online education and the number of students enrolling in online programs (Hartnett, George, & Dron, 2014; Haythornthwaite & Andrews 2011). Online education emerged in the 1990s with the Internet (Deming, Goldin, Katz & Yuchtman, 2015), and in higher education, online courses are becoming ever more common (Johnson, 2008; Bart, 2012; Liaw, 2008). In some institutions and programs, online courses have completely replaced the traditional teaching methods, while in others it supplements traditional courses (Hartnett, 2016; Hoskins & Van Hooff, 2005; Herron & Wright, 2006; Simonson, Zvacek, & Smaldino, 2019). Many American universities are trying to compete for student enrollment and have increased the numbers of online courses and online degree programs. According to various surveys, online courses remain to play an increasing role in higher education. One of these surveys was conducted by Allen and Seaman (2017), with a sample of 2,800 universities and colleges. They found that 32% of students over 6.7 million total are taking at least one online course. Of the six million students currently enrolled in at least one online course, close to half are enrolled in programs that are offered exclusively online (Allen & Seaman, 2017). Furthermore, between 1999 and 2015the annual growth rate of online enrollment is increasing at a rate of over 30% every year (Allen & Seaman, 2017; NCES, 2014; NCES, 2018).

Statement of the Problem

Online courses are the most recent evolution of learning methods (Liaw, 2008). Despite the advantages of online courses, they present an entirely new learning environment for students where success in this environment heavily relies on a student's ability to actively engage in the learning process (Wang, Shannon, & Ross, 2013). In online courses, students are required to be more independent and motivated, as the very nature of online settings promotes self-regulated learning strategies such as time management, critical thinking and effort regulation (Zimmerman, 2008). Considerable research has revealed intrinsic motivation to be significantly related to students' ability to achieve academically. In the traditional classroom environment, it has been shown that students who report possessing higher levels of intrinsic motivation have lower levels of anxiety, more favorable perceptions of their competence and, significantly higher academic achievement (Bachman & Stewart, 2011; Deci et al., 1991; Pintrich & DeGroot, 1990; Stewart et al., 2010a; Vansteenkiste et al., 2004). Additionally, although decades of research in the traditional classroom environment has revealed that student academic performance is significantly influenced by and related to motivation (Clark, Middleton, Nguyen & Zwick, 2014;

Schunk, Meece & Pintrich, 2014; Schunk & Zimmerman, 2008), little research exists on the status of intrinsic motivation in the online learning environment. In general, much is unknown about the level of graduate students' intrinsic motivation in fully online courses. Therefore, empirical research is needed to explore this construct in online courses.

THEORETICAL FRAMEWORK

Self-Determination Theory

Self-determination theory (Deci & Ryan, 1985, 2002) is a general theory of motivation that aims to explain the "dynamics of human needs, motivation, and well-being within the immediate social context" (Chen & Jang, 2010, p. 742). Self-determination theory is one of the most widely applied and empirically based psychological theories for understanding factors that promote human motivation (Hodge, 2017). Deci and Ryan (1985) defined the term self-determination as ''a quality of human functioning that involves the experience of choice. It is the capacity to choose and have those choices . . . be the determinants of one's actions" (p. 38). According to Self-determination theory, the three universal and basic human needs are: *autonomy,* which is a sense of control and agency, *competency,* where an individual can have a feeling of competence with tasks and activities, and *relatedness,* which is the feeling of being affiliated with others (Deci & Ryan, 2002). Moreover, Connell (1990) describes autonomy as "the experience of choice in the initiation, maintenance and regulation of activity and the experience of connectedness between one's actions and personal goals and values" (pp. 62–63). When autonomous, students credit their actions and participations to an internal locus of causality and having a sense of freedom and choice over their actions. Competence is defined as "the need to experience oneself as capable of producing desired outcomes and avoiding negative outcomes" (Connell & Wellborn, 1991, p. 51). In addition, relatedness "encompasses the need to feel securely connected to the social surround and the need to experience oneself as worthy and capable of … respect" (Connell & Wellborn 1991, pp. 51–52).

Self-determination theory is a well-known contemporary theory of situated motivation that is based on the essential premise of learner autonomy (Hartnett, 2016). In self-determination theory, motivation can be understood as having three main components as shown in Figure 1. First, intrinsic motivation is where an individual does something because it is enjoyable, optimally challenging, or aesthetically pleasing. Accordingly, self-determination theory assumes that students' inherent intrinsic motivation will be promoted when the learning environment supports each learner's autonomy, competence, and relatedness needs (Deci & Ryan, 1985, 2002). Second, extrinsic motivation, is where the reason behind doing something is that it leads to a particular outcome, and amotivation is where an individual is in the state of lacking intention to act (Deci & Ryan, 1985, 2002). Consequently, when students are more extrinsically motivated, they contribute to activities

because of different reasons separated from the action itself (Deci & Ryan, 1985, 2002). For example, obtaining good grades, avoiding undesirable outcomes, or because the assignment has benefits such as completing a course in order to receive a degree. Finally, amotivation which is the state of lacking intention to act (Deci & Ryan, 1985, 2002). Amotivation results in non-self-determined behavior. Therefore, students who are amotivated may find no value in attending school (Deci & Ryan, 1985, 2002).

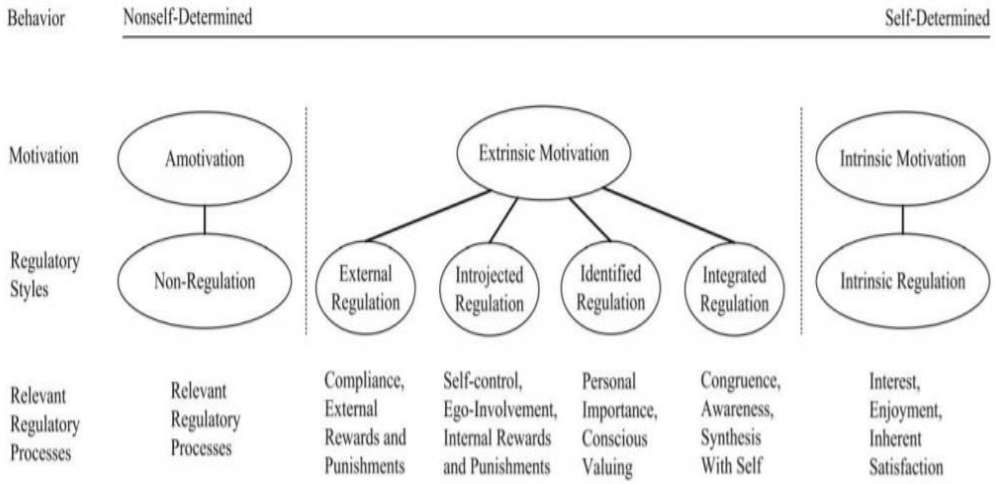


Figure 1. The Self-Determination Continuum (adopted from Ryan & Deci, 2000)

An unhealthy relationship between instructors and learners in terms of interaction during learning process leads to neglecting the role of autonomy and failure in fulfilling students' needs (Martens & Kirschner, 2004). Learners feel more connected and trusting towards their teachers and learning environment when having a supportive relationship that fulfills learners' autonomy and competence needs (Ryan et al., 2005). Therefore, the more teachers are involved in a supportive relationship with learners in regards to the amount of time devoted, care shown, and attention given, the more learners' motivation be encouraged (Brophy, 2010). Additionally, encompassing respect and connectedness are one of the most essential requirements for encouraging and supporting motivation among different groups of students (Ginsberg & Wlodkowski, 2000). Similarly, educational settings that provide learners with opportunities to satisfy their needs for autonomy, competence, and relatedness improve students' self-determination and promote intrinsic motivation. Specifically, activities that are interesting, engaging, and support growth in knowledge increase intrinsic motivation (Bachman & Stewart, 2011; Tsai et al., 2008).

Self-determination theory has served as the framework for research in the domains of education, business, healthcare, psychology, and sports (Gagné et al., 2015; Keshtidar &

Behzadnia, 2017; Li et al., 2016; Matosic et al., 2017; Nikou & Economides, 2017; Ryan & Deci, 2017; Reeve & Lee, 2014). For example, it has been applied in several studies to explore participants' intentions to continue participating and engaging in sport (Keshtidar & Behzadnia, 2017). Similarly, Self-determination theory was utilized in studies to investigate the use of mobile technology (Nikou & Economides, 2017). Nikou and Economides (2017) found a positive environment positively predicted higher level of motivation. Additionally, they found motivation negatively related to intention to continue participating. In general, these studies found that motivation positively predicted intention.

Self-determination theory is considered an appropriate framework for addressing motivation in the online learning environment (Chen & Jang, 2010). Autonomy, relatedness, and competency are identified by self-determination theory as the components of motivation. These three determinants meet with major features of online learning such as flexible learning, computer-mediated communication, social interaction, and challenges for learning technical skills (Chen & Jang, 2010; Gunawardena,1995; Howland & Moore, 2002). Self-determination theory anticipates a variety of learning outcomes such as students' performance, persistence, and course satisfaction (Deci & Ryan, 1985). It also can possibly address learning difficulties, for example students' attrition in the online learning environment (Chen & Jang, 2010). Moreover, self-determination theory can provide instructions for motivational improvement and a clear description of individuals' motivation process (Reeve & Jang, 2006). Self-determination theory-based studies have identified strategies that encourage individual self-determination and motivation (Reeve & Jang, 2006). The self-determination theory -based strategies may play a significant role in a variety of educational settings including the online learning environment. According to self-determination theory, choice contributes to greater degrees of intrinsic motivation; hence, autonomy, performance and engagement can be affected positively by offering informational feedback when individuals are given choices (Deci & Ryan, 1985, 2002). In this context, learners in online learning environment are more likely to continue to value the online activities when they are engaged because they chose to be involved.

Self-determination theory can be utilized as an effective framework to explain the "dynamics of human need, motivation, and well-being within the immediate social context" (Chen & Jang, 2010, p. 743). The Self-determination framework empowers researchers to study how different contextual factors, such as instructor behaviors or social interactions, improve or decrease motivation of online students (Chen & Jang, 2010; Hartnett, 2016). Furthermore, when it comes to identifying the best strategies of designing a supportive online learning environment, self-determination can be considered as a crucial framework for instructors and instructional designers to accomplish that successfully (Chen & Jang, 2010; Hartnett, 2016).

Educational settings that provide learners with opportunities to satisfy their needs for autonomy, competence, and relatedness improve students' self-determination and promote intrinsic motivation. Specifically, activities that are interesting, engaging, and support growth in knowledge increase intrinsic motivation (Bachman & Stewart, 2011; Tsai et al., 2008).

Notable research has illustrated that self-determination theory delivers a useful analytic tool for discovering the complexity of motivation in online contexts (Chen & Jang, 2010; Hartnett, 2010). Therefore, self-determination theory has been applied as a theoretical framework in several studies of online learning (Chen & Jang, 2010; Giesbers et al., 2013; Hsu et al., 2019; Hartnett et al., 2011; Hartnett, 2010; Martens et al., 2004; Rienties et al., 2012; Rovai et al., 2007; Shroff et al., 2007; Shroff et al., 2008; Xie et al., 2006). For instance, in Xie et al. (2006) the researchers investigated learners' motivation and participation in an online discussion form in a traditional lecture-based course by applying self-determination theory as the theoretical framework. The main purpose of this study was to examine the relationship between learners' intrinsic motivation and other crucial problems related to participating in online discussion. Therefore, the researchers used a mixed-methods design to explore students' perceived interest (intrinsic motivation), value (extrinsic motivation), choice (perceived autonomy), course engagement (as measured by the numbers of login and discussion board postings), and attitudes toward the class. In this study, a sample of 123 undergraduate students participated in a normal online discussion as a part of their online course. Findings indicated that there is a positive correlation between the three self- determination theory-based indicators (perceived interest, value, and choice) and online students' course attitude and engagement. In addition, the findings provided evidence that students' participation in online discussion was related to their intrinsic motivation. Additionally, results showed that instructor participation, guidance, and feedback were important to online students' motivation.

Similarly, due to the importance of investigating online learner motivation in order to explore the reasons behind the high attrition rates of online learning, Chen and Jang (2010), conducted a study with a sample of 262 students in in two online certificate programs to investigate online students' motivation, including its antecedents and outcomes. By drawing on Deci and Ryan's self- determination theory, the researchers proposed and tested a model for students' motivation in online learning. The findings revealed that there is a mediating impact of need satisfaction between "contextual support and motivation/self-determination" (p. 741). That implies the supports of autonomy and competency positively influenced online students' perceived autonomy, relatedness, and competency, the satisfaction of the three basic needs. Additionally, findings showed that intrinsic motivation, external, introjected, and identified regulations, and amotivation were different components which is consistent with self- determination theory.

Recently, Giesbers et al. (2013) by utilizing self- determination theory as a framework, conducted a study to discover the relationship between available tools (like chat, audio, and webcam) used, "student motivation, participation, and performance on a final exam in the context of a facultative summer course in economics" with sample of 110 students (p. 3). The researchers assumed that the relationship between students' academic motivation and participation and stated that higher levels of autonomous motivation are related to more participation in web-videoconferences and with the use of richer communication tools when taking part in a web-videoconference. The findings partially supported their assumptions where students' tool use and participation were significantly correlated with each other and with exam scores, "but participation appeared to be a stronger predictor of the final exam score than tool use" (p. 2). In general, studies that have adopted self-determination theory as a framework to study students' motivation in online learning environment are few but starting to appear (Chen & Jang, 2010; Giesbers et al., 2013; Hartnett et al., 2011; Hsu et al., 2019; Hartnett, 2010; Martens et al., 2004; Rienties et al., 2012; Xie et al., 2006).

LITERATURE

Online Learning

In the literature ,there are many different terms are used to describe online courses, such as distance learning, e-learning, internet learning or online learning, where teaching and learning process occurs on computers connected to the internet (Umek et al., 2015). Accordingly, there are several definitions of online courses based on diverse perspectives related to the development of online courses. Katz (2000) defined online learning as the use of telecommunication technology to deliver information for education and training. In order to distinguish between online learning and e-learning, Bates (2005) indicates that e-learning can include any form of technology while online learning refers specifically to the use of the internet and the web. In addition, Bates (2005) used the term fully online to differentiate online courses where students must have access to an internet capable device to start a course.

Several advantages are behind the vast increase of online courses and their popularity among learners. Online courses provide flexibility and accessibility for students whose schedule or location makes it difficult to attend a physical class (Bouhnik & Marcus, 2006). Students are free to access the online course's materials at any time that is convenient. Moreover, students who study online, compared to those in traditional classrooms, have more opportunities to express their thoughts, and ask questions, without limitations such as time and number of students (Bouhnik & Marcus, 2006). Accordingly, the development of exchange of information and experiences amongst the students in online learning is more

active and efficient comparing to traditional classrooms (Richardson, Maeda, Lv, & Caskurlu, 2017).

Online learning environment provides teachers a range of active learning techniques to maintain the quality of teaching and the communication of expectations between the instructor and the learner (Peterson, RubieDavies, Osborne & Sibley, 2016; Pedaste et al., 2015). In this regard, Oyarzun, Stefaniak, Bol and Morrison (2017) argue that in online learning setting, the presence of contact between the instructors and the learners is more encouraged through various means. Instructors become more capable of providing prompt feedback to learners and personalizing lessons to cater to student strengths, and grow more efficient in delivering high-quality teaching (Johnson & Cuellar-Mejia 2014; Jaggars & Xu 2016; O'Flaherty & Phillips, 2015). In addition, in order to identify factors that affect overall student retention, momentum, and success, online learning provides opportunities for instructors and administrators to collect rich data that can be used to assess student behavior such as preparedness, performance, and preferences that are far more difficult to get in traditional courses (Johnson and Cuellar-Mejia 2014; Jaggars and Xu 2016).

Students' Intrinsic Motivation in Fully Online Courses

Research predicted that intrinsic motivation would differ for online and face-to face education (Johnson et al., 2015). Knowing the features and the nature of online learning environment and how learning processes go, intrinsic motivation is the main source that triggers and sustains learning process. Intrinsic motivation has been identified as an important characteristic of online learners (Shroff et al., 2007). In online learning environment, research has shown that intrinsic motivation is associated with intent to participate and persistence (Hartnett, 2016; Johnson et al., 2015). Intrinsically motivated online students demonstrate a deeper understanding of the course material (Hoskins & Van Hooff, 2005). In addition, students with high intrinsic motivation are more likely to perform better than students with low intrinsic motivation and engage in more task-related discourse (Rienties et al., 2009). Since online learning environment typically depends on intrinsic motivation and the associated characteristics of curiosity to engage students, online students are often required to have a high level of intrinsic motivation (Martens et al., 2004). Most of features and factors of face to face environment such as having a teacher or counsellor to direct and encourage students in the learning process are not available in online learning environment. In addition, in online learning environments, learners have a tendency to study on their own; therefore, they need to be more intrinsically motivated to ensure sustainability in their studies (Hartnett, 2016; Johnson et al., 2015).

Common Approaches for Measuring Intrinsic Motivation in Education

As a result of the complexity of the nature of motivation in general, intrinsic motivation is still considered a matter of disagreement in terms measurement (Bachman & Stewart,

2011; Chang, 2005; Chyung et al., 2010; Conroy, 2001; Smith et al., 2002; Grant, & Dweck, 2003; Jones & Skaggs, 2016; Pintrich & DeGroot, 1990; Shia, 1998). Historically, researchers have developed several approaches of measuring academic intrinsic motivation. However, considering the complexity of motivation, all those approaches of measuring academic intrinsic motivation are varied based on the diversity of researchers' perspectives towards motivation (Elliot & Church,1997; Grant, & Dweck, 2003; Jang et al., 2016; Miltiadou & Savenye, 2003; Pintrich & DeGroot, 1990; Ryan et al., 1990; Reeve & Sickenius, 1994; Shia, 1998). Therefore, this section provides a brief historical overview for the most common academic intrinsic motivation measures in the literature.

One the most well-known and widely-adopted measure for academic intrinsic motivation is the Intrinsic Motivation Inventory (IMI; Ryan, 1982). It is a multi-dimensional measurement to assess participants' intrinsic motivation and self-regulation in different fields. Overall, this instrument consists of 45 items divided unequally to the seven subscales. Even though the overall questionnaire is called the Intrinsic Motivation Inventory, there is only one subscale that measures intrinsic motivation. The IMI items have been improved slightly to be suitable for specific fields. In addition, many studies have been conducted to confirm its validity. For example, McAuley et al. (1989) performed a study to examine the validity of the IMI and found a strong support for its validity. Also, Tsigilis and Theodosiou (2003) found a Greek version of the scale to be reliable. This questionnaire has been used in many research related to assess participants' intrinsic motivation and self-regulation (e.g., Deci et al., 1994; Plant & Ryan, 1985; Ryan, 1982; Ryan et al., 1983; Ryan et al., 1990; Ryan et al., 1991).

Archer (1994) proposed a scale to measure higher education learners' mastery goals, performance goals (the concern to demonstrate ability to others), and goal alienation (the lack of academic goals). The inventory consists of eight scales and all items are rated on a 5-point Likert-type scale with "five" representing the most positive response. Archer (1994) reported that coefficients of the goal orientation scales are $\alpha = 0.84$ for the mastery scale, $\alpha = 0.80$ for the performance scale, and $\alpha = 0.70$ for the alienation scale. One example use of this survey is the study conducted by (Perrot et al., 2001) to measure goal orientation preferences of students in health professions programs. According to their study, the scale proved to be a valid measure.

Considering the need of instruments measure the three psychological needs identified in the Self-Determination Theory (autonomy, competence, and relatedness), (Reeve & Sickenius, 1994) developed their Activity-Feeling States (AFS) scales to measure students' intrinsic motivation. The AFS is designed to assess the three psychological needs in the sense of particular activities in order to identify the degree to which environmental factors influence these needs (Reeve & Sickenius, 1994). The researchers developed the scale to

be applied in many activities flexibly and efficiently. The AFS consists of 13-items distributed to four subscales (self- determination, competence, relatedness, and learning tension). Each of these subscales has three or four items related to it and has a 1-7 response scale that ranged from strongly disagree to strongly agree. In terms of reliability and validity, the scale has been shown to be reliable and valid in several studies and it became a useful instrument to measure students' intrinsic motivation based on their three psychological needs of autonomy, competence, and relatedness (Jang et al., 2016; Jang et al., 2009; Reeve & Lee, 2014; Reeve & Tseng, 2011; Reeve et al., 2003).

After recognizing several issues in their 2001 version of goal orientation survey, Elliot and Murayama (2008) revised the items in their old survey to produce the new survey with more reliability and validity. The achievement goal questionnaire-revised (AGQ-R) consists of 12 items in total with each goal orientation measure containing of 3 items. AGQ-R used a consistent questioning pattern to make items easier to read and understand. With each goal orientation still containing equal numbers of items, they all start with the same pattern as "My aim is to …; I am striving to …; My goal is to …". In order to test the psychometric properties of the revised survey, Elliot and Murayama (2008), used a sample of over 200 undergraduates, and they reported quite satisfactory internal consistency for each goal orientation (Cronbach's α = .84, .88, .92, and .94 respectively). This survey has become a valuable tool to measure subjects' intrinsic motivation and utilized in several studies (e.g., Conroy, 2001; Grant, & Dweck, 2003; Smith et al., 2002).

Shia, (1998) argues that success in higher education is positively impacted by learners' academic intrinsic motivation. Therefore, the researcher developed an Academic Intrinsic Motivation inventory (AIM: Shia, 1998). The AIM scale includes a total of 59 items divided to two factors to assess intrinsic motivations and four factors to measure extrinsic motivations. All items are rated on a 7-point Likert-type format scale ranging from "does not describe me" to "strongly describes me". Uyulgan, and Akkuzu (2014) provided a validation evidence for the AIM scale with Cronbach's alpha .86. The inventory can provide many opportunities for researchers in the fields of both educational psychology and social psychology. For example, Kerr et al. (2006) utilized the AIM scale as one of their measurements in order to investigate student characteristics for online learning success.

One of the most common intrinsic motivation measures is MUSIC model of academic motivation inventory (MUSIC Inventory; Jones, 2012). The MUSIC acronym stands for eMpowerment, Usefulness, Success, Interest, and Caring. Initially, Jones (2009) proposed a MUSIC model that can be utilized as a design instruction in any educational setting in order to motivate learners, "diagnose motivational strengths and weakness of instruction, and to research relationships among factors critical to student motivation" (Jones, 2009).

The MUSIC model is a conceptual model based on many different theories and focuses on how social contexts affect students' perceptions of key motivational beliefs (Jones, 2009). The five key principles of the model are eMpowerment, Usefulness, Success, Interest, and Caring which considered are as broad instructions for teachers to give students control, confidence and interests during the learning process (Jones, 2009). Considering the five key principles of MUSIC model, Jones (2012) created and validated MUSIC Inventory which consists of 26 items that are rated on a 6-point Likert-type format scale and structured into five scales including five empowerment items, five usefulness items, four success items, six interest items, and six caring items. Jones and Skaggs (2016) provided a validation evidence for the MUSIC Inventory by using 221 different courses at a large public U.S. university. Their results indicated that the scores produced by the MUSIC Inventory are valid for use with college students. MUSIC Inventory is an effective tool for instructors and researchers to measure students' motivational beliefs in any field of learning (Jones & Skaggs, 2016).

The Need for Additional Research

Despite the emerging research regarding online learning, little attention has been given to students' intrinsic motivation in online courses (Jones & Issroff, 2005; Miltiadou & Savenye, 2003; Bekele, 2010; Hartnett, 2016). In particular, considering the five main components of intrinsic motivation according to self-determination theory (inherent, interest, enjoyment, satisfaction, and autonomy) that determine the level of learner's intrinsic motivation (Deci & Ryan ,2012), there is a need to conduct more studies under the umbrella of self-determination theory in order to investigate intrinsic motivation in online learning environment and determine motives of it's the constructs during the learning proses in fully-online courses.

Research Questions

This study aims to examine and understand the level of graduate students' intrinsic motivation in fully online learning environments. The study seeks to contribute to creating an understanding of graduate students' intrinsic motivation in fully online courses in order to enhance the online learning environment and the quality of the outcomes of those courses by exploring the following questions:

1. What is the level of graduate students' intrinsic motivation in fully online courses?

Hypothesis to RQ1: as past studies indicated that in online learning environment, students tend to be more intrinsically motivated (Chyung et al., 2010; Fırat et al., 2018; Hartnett et al., 2014; Hoskins & Van Hooff, 2005; Johnson et al., 2015), in this study, it is hypothesized that the level of graduate students' intrinsic motivation is high in fully online course environments.

2. Is there a significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of: a. gender, b. registration status, c. employment status, and d. experience with fully online courses?

Hypothesis to RQ2: There is no significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of gender, employment status, registration status, and experience with fully online courses

METHODOLOGY

Participants

The study was conducted during the Fall semester of 2020-2021 academic year. The target population of this research is Educational Theory & Practice graduate students at a public research university in upstate New York. This research location provides a wide selection of certificate and degree completion programs including face to face course, blended courses, and fully online courses. In particular, the population that were used in this study included 270 master's students taking one or more of the total of 32 master's level courses during the fall of 2020. Thirty courses of them were offered as fully online courses and two as blended courses. The participants in this study were volunteer and currently enrolled in a fully online master's level courses or who had recently taken at least one fully online class at the School of Education at University at Albany. No exclusion criteria was set for participants other than being a master's student over the age of 18. In additon, all Educational Theory & Practice master's students, regardless of their gender, race, academic standing, ethnicity, or other demographic characteristics were eligible to participate in this study**.**

In regard to courses delivery, Blackboard Learn was used as the school's Learning Management System (LMS). Blackboard Learn is a virtual learning environment and learning management system developed by Blackboard Inc. It is a Web-based server software which features course management, customizable open architecture, and scalable design that allows integration with student information systems. Its main purposes are to add online elements to courses traditionally delivered face-to-face and to develop completely online courses with few or no face-to-face meetings. This provides instructors the freedom to design their courses to satisfy their style of teaching and their students' needs. In addition, the university provides faculty with several resources, training, and support options to develop their courses.

Power Analysis

Sample size was determined using Cohen's power analysis (Cohen, 1992). According to Cohen (1992), "for research planning, it is most useful to determine the *N* necessary to have a specified power for a given α, and ES" (p. 156). Cohen (1992) recommended that, when research is planned that will use one-way ANOVA for three groups with significance of α = .05, a medium effect size, $f = .25$, and a statistical power of .80, a sample size of 75 is needed. In addition, according to Cohen (1992), with a medium effect size of $d = .50$, a significant alpha = .05 and a statistical power of .80, the desired sample size to use an independent samples *t*-test analysis is 64. This indicates that the sampling size can range from a minimum of 64 for performing one-way ANOVA and an independent samples *t*-test analysis to a maximum of 75 as recommended by Cohen (1992). Being that 127 graduate students participated in this study; the desired sample size was obtained to achieve the desired power

Intrinsic Motivation in E-Learning IMeL Questionnaire

Graduate students' level of intrinsic motivation in fully online courses was measured using Intrinsic Motivation in e-Learning IMeL Questionnaire developed by a group of researchers in Anadolu University, Turkey to improve online learning environment (Fırat et al., 2018). This survey was designed to measure college students' level of intrinsic motivation in online courses. IMeL questionnaire operationalizes elements of intrinsic motivation in self-determination theory described earlier. IMeL includes five questions with 5-point Likert scales that can be used to assess college students' level of intrinsic motivation in online courses. According to Fırat et al. (2018), in their developing IMeL, they referred to experts and many studies in the related literature including self-determination theory and ARCS Model Keller (1984) that define four major conditions (Attention, Relevance, Confidence, and Satisfaction) that have to be met for people to become and remain motivated (Cerasoli et al., 2014; Chen & Jang, 2010; Deci, 1975; Deci & Ryan, 2012; Hartnett et al., 2011; Miltiadou & Savenye, 2003; Moore, 1993; Ryan & Deci, 2000a). In the first stage of developing the questionnaire, researchers established an item pool consisting of 15 items by relating to literature. Considering the five main components of intrinsic motivation (inherent, interest, enjoyment, satisfaction, and autonomy) in Self-determination Theory Deci and Ryan (2012), three items for each of the five main components were included in the questionnaire. Later, researchers excluded and revised some items based on experts' opinions which resulted five items. In order to establish the construct validity of the questionnaire, researchers utilized principal component analysis (PCA). Consequently, PCA revealed one component with total 3.791 eigenvalue, which explained 75.817% of the total variance (see Table 1). According to Tabachnick and Fidell (2001), factor loadings of the items collected under one factor can be considered excellent when they varied between minimum .753 and maximum .922 and loadings in excess of .7. Therefore, it can be said that IMeL questionnaire has a strong

single-factor structure. Written permission from Fırat et al. (2018) to use the IMeL and the exact questions is displayed in.

Table 1. IMeL Questionnaire Items Factor Loadings (Fırat et al., 2018)

ITEMS	Components
I enjoy studying in fully online courses environment (enjoyment)	.92
I prefer to study in fully online courses environment even if I have printed materials (inherent)	.92
I look forward to studying in fully online courses environment (interest)	.91
I'm satisfied with my studies in fully online courses (satisfaction)	.82
I set my own learning needs (autonomy)	.75

Rationale for Using the IMeL to Measure the Level of Students' Intrinsic Motivation

The IMeL has proven to be a valid, reliable measure of students' level of intrinsic motivation in online learning environment (Fırat et al., 2018). The existing instrument from literature was used in this study was sufficient for the constructs it measured and that it was sufficiently valid instruments based on the literature available for this instrument. Therefore, considering the match of research purpose, the researcher adapted IMeL questionnaire for this study. It was appropriate to use for this study because (1) the previous questionnaires used in literature were designed to evaluate and measure individuals' motivation in general including all types of motivation; (2) the main purpose of all previous questionnaires were to measure learners' motivation in face to face learning environment which was not the research setting in this study; (3) the only questionnaire that was designed to measure the level of intrinsic motivation of college students in online learning environment particularly is IMeL questionnaire which fitted the main purpose of this study; (4) IMeL questionnaire was designed under the umbrella of self-determination theory and utilizes the five main components of intrinsic motivation in STD (inherent, interest, enjoyment, satisfaction, and autonomy) which aligned with the framework of this study.

Study Procedure

In order to collect data from participant to answer the research questions, IMeL questionnaire was administered. Questionnaires are common and useful tools for collecting data from participants. Conducting the study online allowed for execution of the questionnaire at multiple locations while minimizing impact to the participants. For this study, the questionnaire was created in Qualtrics platform.

Potential participants from all the ETAP master's students were asked to participate in this study and were informed in both a recruitment e-mail and the informed consent that there were no risks involved in participating in the study. Both of these documents included an overview of the research study, what it entailed and reassurance of confidentiality and

anonymity. Both documents encouraged students to take their time to think about whether they would accept or decline to participate in the study. In addition, they were reassured that there would not be any negative consequences if they did not participate. The students also were informed that the information collected through the questionnaire would be anonymous to ensure their privacy and confidentiality and that they could withdraw from the study at any time if they chose to without penalty. Moreover, students were informed the importance of the study to the higher education system in order to generate maximum participation.

Prospective participants received a recruitment e-mail during Fall 2020 semester. The e-mail informed them that if they decided to participate in the research study, they had to read the informed consent, which they were instructed to access via the link at the bottom of that page. If they did not desire to participate, they were thanked for their time. Those students who intended to participate were further instructed to (1) read the informed consent, (2) completed the questionnaire that they were directed to access via a link at the bottom of the informed consent.

Data Collection and Analysis

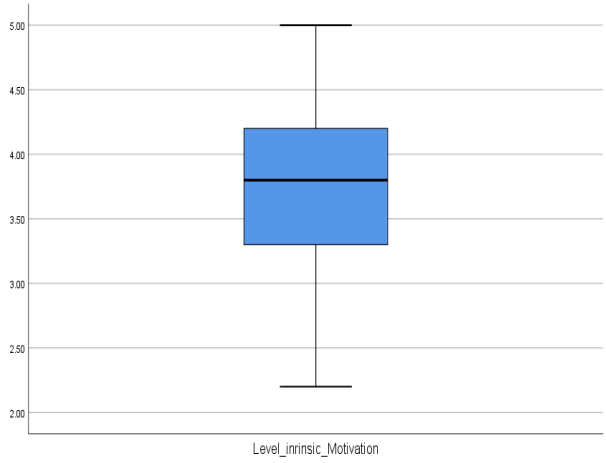
The collected survey data from Qualtrics was transferred to SPSS for analysis. Next, the data was screened to remove any incomplete submissions or significant outliers. Any part of the questionnaire found to have missing data was eliminated from the analysis process (Mertler & Vannatta, 2005). In order to evaluate the demographics of the sample, a descriptive analysis was performed.

For the first research question, standard deviation and mean statistics was utilized. The comparison of means procedure is useful when summarizing and comparing differences in descriptive statistics across one or more factors, or categorical variables (Mertler & Vannatta, 2005). The second research question was examined by using independent two-sample t-test and one-way ANOVA (analysis of variance). Two-sample t test is an appropriate analysis that measures group differences, which analyzes significant differences between two group means (Mertler & Vannatta, 2005). Consequently, in order to compare the level of intrinsic motivation scores of the graduate students in online course environments by their genders and registration status, an independent two-sample t-test was conducted. In addition, One-way analysis of variance (ANOVA) is an appropriate analysis that tests the significance of group differences between two or more means as it analyzes variation between and within each group (Mertler & Vannatta, 2005). Therefore, One-way ANOVA test was utilized to compare the level of intrinsic motivation scores of the graduate students in online course environments by their employment status and their experience with fully online courses**.**

RESULTS

The data collection for this study had secured 139 participants. Missing data, however, is a common problem for most survey studies that must be addressed before any further statistical analysis. The online survey collectors (Qualtrics) not only offered accessibility for data collection process, they also provided handy data cleaning operation. First of all, the aggregated survey completion percentage report showed that there were 9 out of 139 participants who only completed the demographic part; their input had to be removed because it did not provide useful information in regards to the research questions in this study. Another 3 participants just went a little bit further by addressing the first two questions of the entire questionnaire. This portion was also removed because such high percentage of missing input would not provide any important and meaningful interpretation for this study. As a result of the above steps of cleaning, the total sample size was reduced from 139 to 127 valid cases. Additionally, since boxplots provide useful information about outliers (Cohen et al., 2013), Boxplots diagnostic was used to identify outliers. As seen in Figure 2, boxplots indicated no outlier cases for the level of graduate students' intrinsic motivation.

Figure 2. Boxplots for Level of Students' Intrinsic Motivation



Demographic Data

The majority of the sample identified themselves as female (70 %). The sample ranged in age from 22 to 60 with majorty of 22 to 30 (60 %). Participants had varying levels of experience with fully online courses with (57 %) of graduate students having taken five or more fully online courses, (21 %) having taken three to four fully online courses, and (22 %) having taken one to two fully online courses. In addition, the majority of the sample defined their employment status as full-time employee (60%), part-time employee (25%),

and not employed (15%). In terms of registration status, (43%) of the participants were full time students and (57%) part time students.

Validity and Reliability of IMeL

Quantitative research requires the establishment of the grounds for validity and reliability of the instrument used in the study. Althogh Intrinsic Motivation in e-Learning IMeL Questionnaire has been used in research and has had its validity and reliability established (Fırat, et al., 2018), in this study Cronbach's alpha was used to assess the reliability of IMeL in this study's sample. Cronbach's alpha reliability coefficients range between 0 and 1. The closer the Cronbach's alpha coefficient is to 1.00, the greater the internal consistency of the items in the scale (Cobb, 2009; Gliem, 2003; George, & Mallery, 2019). Consequently, IMeL was found to have high reliability (Cronbach's $\alpha = .82$).

Research Question one: First of all, according to Fırat et al. (2018) study, using the computing mean score method, all responses to IMeL items were averaged to make one intrinsic motivation scale. The research question one, what is the level of graduate students' intrinsic motivation in fully online courses? was proposed to be analyzed by using means and standard deviation statistics. Accordingly, mean values for each item in the IMeL questionnaire and standard deviations of 127 graduate students participating in the study are displayed in Table 2. As seen in Table 2, the level of intrinsic motivation factor of the fully online courses students participating in the study was above 3 (M = 3.80). In other words, there were high frequencies of scores above the mean for all determinants of intrinsic motivation. The mean values of the graduate students' intrinsic motivation in IMeL questionnaire varied between 3.40 and 4.21. Each element of IMeL questionnaire represents one of the most essential five determinants of the level of intrinsic motivation in fully online courses environment. Accordingly, it is observed that the level of intrinsic motivation of graduate students was higher than average in fully online courses environment.

Furthermore, the mean values for items of *satisfaction* and *enjoyment* for participants in fully online courses environments were similar 3.91 and 3.80, while the mean values for *inherent* and *interest* of participants were similar 3.40 and 3.50 as shown in Table 2. However, the mean values for *autonomy* (4.21) and *inherent* (3.40) were outstandingly different from the average. Accordingly, the highest mean value of the determinants of intrinsic motivation of fully online courses students was observed in *autonomy* (4.21), whereas the lowest mean value was observed in inherent (3.40). After presenting the descriptive statistics of students' intrinsic motivation, the following section will be going into the statistical analyses of difference of students' intrinsic motivation levels between groups (gender, registration status, experience with fully online courses and employment status).

Table 2. The Mean for Each Item in The IMel Questionnaire

ITEMS	*M*	*SD*
I enjoy studying in fully online courses environment (enjoyment)	3.80	0.82
I prefer to study in fully online courses environment even if I have printed materials (inherent)	3.40	1.14
I look forward to studying in fully online courses environment (interest)	3.50	.94
I'm satisfied with my studies in fully online courses (satisfaction)	3.91	.77
I set my own learning needs (autonomy)	4.21	.76

Research Question two: Is there a significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of: a. gender, b. registration status, c. employment status, and d. experience with fully online courses? was proposed to be analyzed by using independent two-sample t test and one-way ANOVA with gender, registration status, employment status, and experience with fully online courses as independent variables and level of graduate students' intrinsic motivation as the dependent variable.

First, as seen in Table 3, the male group (N = 39) was associated with the level of graduate students' intrinsic motivation of M = 3.52 (SD =.73). By comparison, the female group (N = 88) was associated with a numerically higher level of graduate students' intrinsic motivation of M = 3.90 (SD =.63). To test the hypothesis that there is a statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of gender, an independent samples t-test was performed. Initially, the assumption of normality distribution of data was tested and satisfied via Shapiro-Wilk's test (p >.05) and a visual inspection of Q-Q plots showed that the data were approximately normally distributed for both male and female participants with a skewness of -.025 (SE = .37) for males and -.097 (SE = .25) for females. Additionally, the assumption of homogeneity of variances was tested and satisfied via Levene's F test, $F(125) = 2.41$, $p >$ .05. The independent samples t-test revealed a statistically significant effect, $t(125) = -2.73$, $p < .05$. Thus, there was statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of gender where female students reported statistically significantly larger mean level of intrinsic motivation. Cohen's d was estimated at .66, which was a medium effect based on Cohen's (1992) guidelines.

Table 3. Descriptive Statistics and T-Test Results of Intrinsic Motivation by Gender and Registration Status

Variables	Groups	*N*	*M*	*SD*	*t*	*P* (two-way)
Gender	Male Female	39 88	3.52 3.90	.73 .63	-2.73	.01
Registration status	Full Time Part Time	53 74	3.60 3.80	.73 .62	-2.29	.17

Second, as shown in Table 3, the full-time group (N = 53) rated their level of intrinsic motivation in average at M = 3.60 (SD =.73). By comparison, the part-time group (N = 74) rated a numerically higher level of intrinsic motivation M = 3.80 (SD =.62). To test the hypothesis that there is a statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of registration status, an independent samples *t*-test was performed. Initially, the assumption of normality of distribution of data was tested and satisfied via Shapiro-Wilk's test (p >.05) and a visual inspection of Q-Q plots showed that the data was approximately normally distributed for both full time and part time with a skewness of -.05 (SE = .32) for full time and -.11 (SE = .23) for part time students. In addition, the assumption of homogeneity of variances was tested and satisfied via Levene's F test, $F(125) = 3.84$, $p > .05$. The independent samples *t*-test was associated with no statistically significant effect, $t(125) = -2.29$, $p > .05$. Thus, there was no statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of registration status. Cohen's d was estimated at .57, which is a medium effect size based on Cohen's (1992) guidelines.

Third, the descriptive statistics with the level of graduate students' intrinsic motivation across the three groups are reported in Table 4. It can be seen that the unemployed group had numerically the smallest mean level of intrinsic motivation of (M = 3.60) and the full-time employed group had numerically the highest mean level of intrinsic motivation (M = 3.85). In order to test the hypothesis that there is a statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of employment status (full-time, part-time, not employed), a one-way ANOVA was performed. Prior to conducting the one-way ANOVA, the assumption of normality of distribution of data was tested and satisfied via Shapiro-Wilk's test (p >.05) and a visual inspection of Q-Q plots showed that the data was approximately normally distributed for all full time, part time and not employed students with a skewness of -.10 (SE = .27) for full time, a skewness of -.40 (SE = .42) for part time and a skewness of -.53 (SE = .52) for not employed. In addition, the assumption of homogeneity of variances was tested and satisfied based on Levene's F test, $F(2, 124) = 1.50$, $p > .05$. The one-way ANOVA yielded no statistically significant effect, $F(2, 124) = 1.60$, $p > .05$. $\eta^2 = .27$. Therefore, the null hypothesis of no difference in the level of graduate students' intrinsic motivation by employment status was not rejected, and we can say that there was no statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of employment status (full-time, part-time, not employed).

Table 4. Descriptive Statistics and ANOVA Results of Intrinsic Motivation by Experience and Employment

Variables	Groups	*N*	*M*	*SD*	*F*	*P* (two-way)
Employment status	Full Time	77	3.85	.62	1.60	.21
	Part Time	31	3.63	.72		
	Not Employed	19	3.60	.80		
Experience	First fully online course	14	3.20	.84		
	Second fully online course	13	3.44	.60		
	Third fully online course	16	3.70	.58		
	Fourth fully online course	10	4.10	.00		
	Fifth+ fully online course	74	3.50	.71		

Fourth, descriptive statistics for the level of graduate students' intrinsic motivation across the five groups are reported in Table 4. It can be seen that the group of graduate students who have taken one fully online course reported numerically smallest mean the level of intrinsic motivation (M = 3.60) and the group of graduate students who have taken five fully online courses reported the highest mean level of intrinsic motivation (M = 3.80). In order to test the hypothesis that there is a statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of experience with fully online courses (first, second, third, fourth, fifth+), one-way ANOVA was performed. Prior to conducting the one-way ANOVA, the assumption of normality of distribution of data was tested and satisfied via Shapiro-Wilk's test (p >.05) and a visual inspection of Q-Q plots showed that the data was approximately normally distributed for all groups with a skewness of .34 (SE = .61) for first online course, -1.05 (SE = .59) for second online course, -.33 (SE = .55) for third online course, -1.08 (SE = .68) for fourth online course and a skewness of -.14 (SE = .28) for fifth online course. Additionally, the assumption of homogeneity of variances was tested and satisfied based on Levene's F test, $F(4, 122) = 1.95$, $p = .10$. In addition, the one-way ANOVA yielded no statistically significant effect, $F(4, 122) = .30$, $p > .05$. $\eta^2 = .87$. Therefore, the null hypothesis of no difference in the level of graduate students' intrinsic motivation based on experience with fully online courses was not rejected, and we can say that there was no statistically significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of experience with fully online courses.

DISCUSSION

Online courses enrollments have been increasing in many universities and colleges. Many universities believe that online education is significant for their long-term strategy to provide opportunities and meet the needs of a growing and increasingly diverse student

population (Liaw, 2008; Rumble & Latchem, 2004; Seaman et al., 2018). Consequently, this research was conducted to determine the level of students' intrinsic motivation in fully-online courses environment. In addition, the level of students' intrinsic motivation was compared by certain demographic features of the students. Intrinsic Motivation in e-Learning IMeL questionnaire with a sample of 127 graduate students from a public research university in upstate New York was used to answer the first two research questions; 1. What is the level of graduate students' intrinsic motivation in fully online courses? 2. Is there a significant difference in the level of graduate students' intrinsic motivation in fully online courses in terms of demographic features of the students.

For the research question one, participants (fully online graduate students) reported above the average intrinsic motivation in the IMeL questionnaire. Accordingly, the findings reveled that graduate students had high levels of intrinsic of motivation in online courses environment. In this regard, the current research findings are consistent with past research showing that in online learning environment, students tend to be more intrinsically motivated (Chyung et al., 2010; Fırat et al., 2018; Hartnett et al., 2014; Hoskins & Van Hooff, 2005; Johnson et al., 2015; Kim & Frick, 2011). It has also been reported in the literature that, intrinsically motivated online students demonstrate a deeper understanding of the course material (Fırat et al., 2018; Hartnett et al., 2014; Hoskins & Van Hooff, 2005). Furthermore, after analysis of the IMeL scores based on the five determinants of the level of intrinsic motivation, the current study found that the determinant of intrinsic motivation with the highest average for the fully online courses students is *autonomy*. This finding supports self-determination theory and, it is similar to past research that found *autonomy* is positively related to graduate students' intrinsic motivation in online learning environment (Chen & Jang, 2010; Fırat et al., 2018; Ryan & Deci, 2017; Zhou, 2016). Self-determination theory emphasized individual sense of choice, volition, and commitment Deci and Ryan (2010), which is defined as *autonomy* that is an essential element in online learning process (Bouhnik & Marcus, 2006; Richardson et al., 2017). Notable empirical research in self-determination theory has confirmed that when these needs are satisfied, a range of positive practical outcomes can be expected in terms of quality of motivation and self-regulation (Chen & Jang, 2010; Ryan & Deci, 2017,). Concerning intrinsic motivation, self-determination theory assumes that social and environmental circumstances that support *autonomy*, *competence*, and *relatedness* will increase intrinsic motivation, whereas conditions that undermine these basic psychological needs will result in low levels of intrinsic motivation (Ryan & Deci, 2017).

For the research question two, past research has shown that motivation is not related to students' gender (Cerasoli et al., 2014; Fırat et al., 2018; Martens et al., 2004; Stewart & Johnson, 2010a). Therefore, it was expected that online graduate students' intrinsic motivation would not be different in terms of students' gender. However, the findings of

this study did not support that and revealed that the level of graduate students' intrinsic motivation in fully online courses differ significantly by their gender where female students report statistically significantly larger mean level of intrinsic motivation. Nevertheless, it is crucial to note that the sample of this study is predominantly female which might be a major factor contributing to this significant difference.

Moreover, in the context of graduate students' experience with online courses and its impact on the level of intrinsic motivation, this study found that there is no difference between graduate students' level of intrinsic motivation based on their experiences with online courses. This finding contradicts past research indicating that motivation is affected by students' prior experience with online courses (Ivankova & Stick, 2007; Osborn, 2001; Richardson & Newby, 2006). Research demonstrates that students who have prior experience taking online courses are more confident, motivated, self-regulated, organized and that they utilize more learning strategies and are more likely to complete an online course ((Richardson & Newby, 2006; Osborn, 2001). For example, Ivankova and Stick (2007) found a number of factors that enhanced students' intrinsic motivation including their experience with online courses and viewing completion of the course as a personal challenge and an ultimate goal. In addition, research indicates that students become more responsible for their own learning as they gain experience with online learning (Hattie & Gan, 2011).

Limitations and Future Research

Although this study advances the literature, as with all research, there are several limitations that should be discussed. Because data was collected at the end of the college semester it is possible that students were not as highly motivated to participate as they may have been earlier in the semester. Furthermore, students may not have been utilizing as many motivational and self-regulatory skills for the same reason. Consequently, it might be more telling if students' intrinsic motivation was measured at mid-semester, as opposed to the end of the semester. Although all the ETAP graduate students were asked to participate in this study, only students who are currently taking or have recently taken a fully-online class were able to participate because the majority of courses is blended. Therefore, it is difficult to generalize results to different types of online courses. Similarly, in context of generalizability, intrinsic motivation certainly is not just limited to graduate college level students, undergraduate students are also in their critical stage to shape their future majors. The research findings from this study should not be easily carried over to these students without caution.

Future research should investigate intrinsic motivation in online learning more thoroughly from a qualitative method angle. More qualitative method research is needed in order to understand the nature of intrinsic motivation in online learning environment profoundly.

This type of research could provide a better understanding of which intrinsic motivational constructs are most important. In addition, future research could try more ways to obtain a large sample size of graduate students in order to create a more comprehensive picture of intrinsic motivation in online course environment. Accordingly, those research ends with providing practical recommendations to enhance the level of student' intrinsic motivations and the learning process's outcomes through rich online learning means, interaction tools, activities, and environments. In regards to measurement, although researchers have developed several questionnaires to measure learners' intrinsic motivation in face-to-face learning environment, IMeL questionnaire used in this study is the only questionnaire that was designed to measure the level of intrinsic motivation of college students in online learning environment. Therefore, there is a need for more research to develop valid and reliable instruments to accurately measure academic intrinsic motivation in online learning environment

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