

10-31-2018

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Recommended Citation

Swafford, M. (2018). The Relationship Between Motivation and Online Self-Regulated Learning. *Journal of Human Sciences and Extension*, 6(3), 6. <https://scholarsjunction.msstate.edu/jhse/vol6/iss3/6>

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The Relationship Between Motivation and Online Self-Regulated Learning

Marshall Swafford

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Success in online learning environments is dependent upon students' abilities to manage their own learning. The self-regulated learning practices of goal setting, environment structuring, task strategies, self-evaluation, time management, and help seeking are developed through experience and motivation. This study sought to determine the levels of self-regulated learning and identify the motivation constructs that correlated to the levels of self-regulated learning of students in an online agriculture dual enrollment course. Students had the highest self-regulation in the areas of goal setting and environment structuring. The lowest online learning self-regulation was in help seeking. Task value was the motivation construct receiving the highest mean score, while test anxiety received the lowest score. Relationships between online self-regulated learning and the motivation constructs of task value, self-efficacy, intrinsic motivation, extrinsic motivation, control beliefs, and test anxiety were statistically significant. Faculty in online courses are encouraged to aid in the development of help seeking, time management, and meta-analysis strategies. Faculty are also encouraged to incorporate valuable tasks within the online curriculum to increase students' motivation to learn. Course developers are encouraged to incorporate problem-based learning, authentic assessments, and team-based learning approaches to better engage students. Research should continue to investigate these practices as they relate to increasing student motivation.

Keywords: motivation, online learning, distance education, self-regulated learning

Introduction

Over the past 12 years, the importance of online programming to higher education has evolved. According to Allen and Seaman (2014), in 2002, less than 50% of all higher education institutions indicated online education was vital to their long-term strategy. By 2014, nearly 70% of these institutions described online education as critical. Similarly, the perceptions of online programming have also increased. In 2012, 77% of academic administrators, up from 57% in 2003, indicated learning outcomes in online education were at least the same as face-to-

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face instruction (Allen & Seaman, 2014). Over a similar period, student enrollment in online programs has also increased. In 2014, 28.5% of all postsecondary students were enrolled in at least one distance education course (Snyder, de Bray, & Dillow, 2016). Of the 20 million students registered in postsecondary education programs, 14% were enrolled exclusively in online courses (Snyder et al., 2016).

Students succeed in online courses by managing their own learning through self-regulated practices. Self-regulation is “an active, constructed process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, behavior, guided and constrained by their goals, and the contextual factors in the environment” (Pintrich, 2000, p. 453). Self-regulated learning refers to one’s ability to understand and control their learning environment (Schraw, Crippen, & Hartley, 2006) and must be developed over time (Chumbley, Haynes, & Hainline, 2015). Students will not be successful in online programs when expected to acquire self-regulated skills without preparation (Artino, 2009; Harrell, 2008).

Successful students in online courses manage their learner autonomy and practice individual responsibility (Andrade & Bunker, 2009; Harrell, 2008). Among online students, Bell (2006) found a relationship between self-regulated learning skills and academic achievement in the online environment. Barnard, Paton, and Lan (2008) found that self-regulated learning behaviors mediate the positive relationship between communication and collaboration in online courses and academic achievement. However, students who are not persistent toward achieving their goals, through irresponsibility, run the risk of attrition in this environment (Hart, 2012). Persistence in online courses, influenced by motivation, enables students to mitigate learning community isolation, which can lead to attrition (Hart, 2012). Along with persistence, perseverance is a predictor of academic achievement within the context of self-regulated learning (Wolters & Hussain, 2015).

Through experience (Chumbley et al., 2015) and preparation, students who can regulate their learning know where and how to acquire the knowledge needed to be successful in the online environment (Cunningham & Billingsley, 2003). According to Mega, Ronconi, and De Beni (2014), self-regulated learning and motivation mediate the effects of student emotions on academic achievement. Successful self-regulators employ critical thinking, take ownership for their learning, and actively participate in the learning process (Chung, 2000). Students who effectively regulate their learning are more likely to find academic success in online programs (Bell, 2006).

Researchers have investigated aspects of student motivation in online programs. Barak, Watted, and Haick (2016) found students in massive open online courses (MOOCs) were motivated intrinsically to learn and participate in online study groups. Hew and Cheung (2014) identified four reasons why students enroll in MOOCs: the desire to extend current knowledge, course

intrigue, the challenging nature of the course, and to collect completion certificates. Within the context of learning, Chang et al. (2014) identified a relationship between students' internet self-efficacy and motivation to learn.

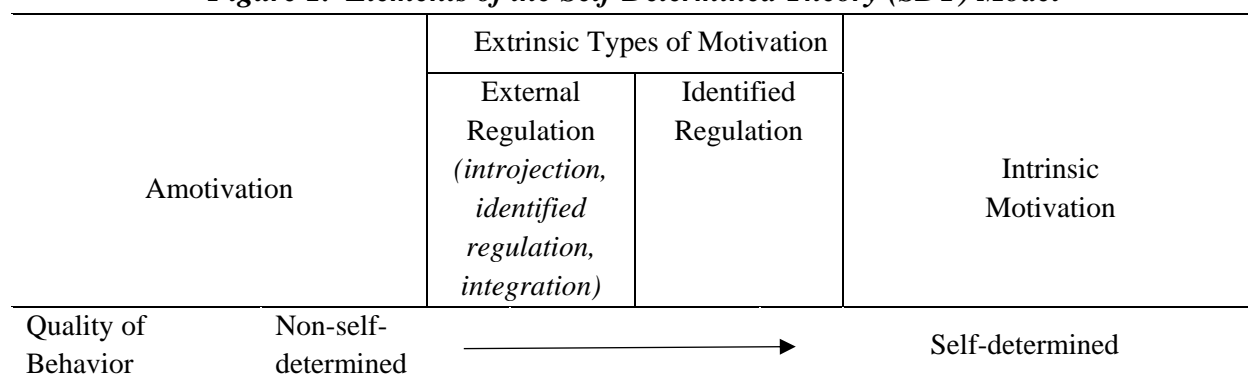
Research focusing on the motivation of secondary students in online agriculture courses is limited. However, Swafford, Hagler, and Waller (2016) determined that students enrolled in a hybrid/online dual enrollment agriculture course were more extrinsically motivated than intrinsically. Other studies focused on secondary students have explored the perceptions of motivation relating to participation in online discussions (Hobgood, 2007).

Pintrich, Marx, and Boyle (1993) posited that the interaction between motivation and cognitive, behavioral, and contextual factors affects self-regulated learning. Pintrich and Zusho (2002) identified differences between good and poor self-regulators in several motivational processes. Good self-regulated learners are more likely to set hierarchical goals while also holding process (e.g., strategies for solving problems) and product goals (e.g., making good grades) (Zimmerman, 2000). As motivation appears to be a key component in developing self-regulated learning skills, a need exists to further explore this phenomenon in the online environment.

Theoretical Framework

Self-determination theory (SDT; Deci & Ryan, 1985) served as the framework for this study. SDT is a theory of situated motivation, which is built upon the premise of learner autonomy. The elements of the SDT model of motivation conceptualized for this study are shown in Figure 1.

Figure 1. Elements of the Self-Determined Theory (SDT) Model



Note: Adapted from Hartnett, St. George, & Dron (2011).

SDT posits that all humans desire to be autonomous as well as to feel capable and connected to others in relation to their environment. Ryan and Deci (2000) stated that more autonomous forms of motivation are promoted if environmental conditions support an individual's autonomy.

Intrinsically motivated students are driven to perform because the reward lies in the activity (Deci, Koestner, & Ryan, 2001). Conversely, *extrinsically motivated* students undertake activities for reasons outside of the activity, including good grades, avoidance of negative consequences, or the perceived value of the task (Ryan & Deci, 2000). However, external factors of motivation can vary, and therefore, different types of extrinsic motivations exist.

Conceptually, motivation is not dichotomous, as SDT includes the idea of *amotivation* or the lack of motivation or intention to act. According to SDT, amotivated individuals may not act due to low self-efficacy (Bandura, 1997), the belief that their actions will not affect the outcome (Peterson, Maier, & Seligman, 1993), or a perceived low value of the task to be undertaken.

Within the continuum of motivation, four patterns of extrinsic motivation have been identified (Hartnett, St. George, & Dron, 2011). *External regulation* refers to the type of motivation where individuals are responsive to threats or the offer of rewards. Students who engage in activities because they believe others expect them to are motivated by *introjection*. *Identified regulation* is associated with student behaviors based on the individuals' perceived task value. This pattern is considered external, as the utility of the task and the end product is more valuable than the enjoyment of the behavior (Brophy, 2008). *Integration* is the final type of extrinsic motivation "where learners engage in the activity because of its significance to their sense of self" (Hartnett et al., 2011, p. 23).

Purpose/Objectives

The purpose of this research study was to describe the relationship between learner motivation and self-regulated learning within secondary students in an online dual enrollment agriculture course. The specific research objectives of this study were to

1. Determine the levels of online self-regulated learning of students enrolled in an online agriculture dual-enrollment course,
2. Describe the level of self-identification by the students enrolled in an online agriculture dual-enrollment course with each of the motivation constructs (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety) as a motivator for them in this class, and
3. Describe the strengths of the relationships between each of the motivation constructs and students' online self-regulated learning scores.

Methods

This study was a descriptive correlational study utilizing results from an online survey.

Participants

The participants in the study were all secondary students enrolled in an online/hybrid introductory horticulture dual-enrollment course ($N = 153$) during the Fall 2016 semester. The students engaged in laboratory activities in class with their secondary agriculture instructor and completed all assessments (tests, quizzes, discussion posts, final projects) online. Table 1 illustrates the demographic characteristics of the students enrolled in the course.

Table 1. Student Demographic Characteristics

Characteristic	<i>N</i>	%
Gender		
Female	74	57
Male	56	43
Academic Level		
Sophomore	31	24
Junior	42	32
Senior	57	44
Race		
Native American	57	44
White	43	33
Hispanic	30	23

Survey Instruments

Data were collected with an online survey, during the last week of instruction, through a link within the course learning management system. Of the 153 students enrolled in the course, 130 completed the survey for a final response rate of 85%.

Self-regulated learning. Self-regulated learning was measured using a short form of the Online Self-Regulated Learning Questionnaire (OSLQ; Barnard, Lan, To, Patton, & Lai, 2009). The OSLQ-short form is a 5-point, 24-item Likert-type instrument with response choices ranging from *strongly disagree* (1) to *strongly agree* (5). Higher scores on this scale indicate better self-regulation in online learning (Barnard et al., 2008). The OSLQ consists of six constructs of self-regulation in online learning: environment structuring, goal setting, time management, help seeking, task strategies, and self-evaluation.

Validity of the OSLQ has been established with previous studies where it has been used to investigate students' self-regulated learning in online and blended courses (Barnard et al., 2009). The internal consistency for this instrument, a proxy for instrument reliability, represented by Cronbach's alphas (α) has been reported as $\alpha = .90$ (Barnard et al., 2009). Nunnally (1978) suggested that Cronbach's alpha values exceeding .70 are acceptable when used in social science research. Table 2 illustrates the Cronbach's alpha values of the six constructs of the OSLQ when used in blended or hybrid courses (Barnard et al., 2009).

Table 2. Internal Factor Reliability of the Online Self-Regulated Learning Questionnaire (OSLQ) as Reported by Barnard et al. (2009)

OSLQ Construct	Cronbach's Alpha Reliability Coefficient
Environment Structuring	.92
Goal Setting	.95
Time Management	.87
Help Seeking	.96
Task Strategies	.93
Self-Evaluation	.94

Note: Responses on a 5-point scale of 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*.

Due to the hybrid nature of the course, students were directed to indicate their levels of self-regulation regarding the educational content in the online portion of the course separately from in-class laboratory activities. Table 3 shows the Cronbach's alpha values of the OSLQ based on the *post hoc* internal factor reliability analyses of the OSLQ conducted in this study.

Table 3. Internal Factor Reliability of the Online Self-Regulated Learning Questionnaire (OSLQ) Calculated Post Hoc in This Study

OSLQ Construct	Cronbach's Alpha Reliability Coefficient
Environment Structuring	.90
Goal Setting	.94
Time Management	.87
Help Seeking	.90
Task Strategies	.87
Self-Evaluation	.90

Note: Responses on a 5-point scale of 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*.

Student motivation. The motivation scales of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991) were used to measure student motivation. The six motivation scales of the larger instrument include 31 items in a 7-point Likert-type format with response choices ranging from *not at all true of me* (1) to *very true of me* (7). The motivation scales of the MSLQ included in this study consist of six constructs of motivation: intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. Table 4 illustrates the Cronbach's alpha values of the MSLQ motivation scales as identified by Pintrich et al. (1991).

Table 4. Internal Factor Reliability of the Motivated Strategies for Learning Questionnaire (MSLQ) Scales as Reported by Pintrich et al. (1991)

MSLQ Scale	Cronbach's Alpha Reliability Coefficient
Self-Efficacy for Learning and Performance	.93
Task Value	.90
Test Anxiety	.80
Intrinsic Goal Orientation	.74
Control of Learning Beliefs	.68
Extrinsic Goal Orientation	.62

Note: Responses on a 7-point scale of 1 = *Not at All True of Me*, 7 = *Very True of Me*.

The *post hoc* Cronbach alpha coefficients, based on the results from the current study, representing internal consistency as a proxy for instrument reliability for the MSLQ motivation scales, are shown in Table 5.

Table 5. Internal Factor Reliability of the Motivated Strategies for Learning Questionnaire (MSLQ) Scales Calculated Post Hoc in This Study

MSLQ Scale	Cronbach's Alpha Reliability Coefficient
Self-Efficacy for Learning and Performance	.93
Task Value	.91
Test Anxiety	.80
Intrinsic Goal Orientation	.75
Control of Learning Beliefs	.68
Extrinsic Goal Orientation	.63

Note: Responses on a 7-point scale of 1 = *Not at All True of Me*, 7 = *Very True of Me*.

Findings

Research objective one of this study was to determine the levels of online self-regulated learning of students enrolled in an online agriculture dual-enrollment course. Self-regulated learning was measured using the OSLQ-short form. Students had an overall self-regulated online learning mean score of 3.49 ($SD = .45$) on a 5-point scale. The dual-enrollment students were found to have the highest level of online self-regulated learning within the construct of goal setting ($M = 3.65$, $SD = .66$). Goal setting refers to concepts connected to setting standards and short and long-term goals to guide one's learning (Pintrich et al., 1991). Conversely, students scored the lowest in the construct of help seeking ($M = 3.36$, $SD = .45$). Table 6 provides average students' scores for each of the six constructs of online self-regulated learning.

Table 6. Overall Self-Regulated Learning Scores by OSLQ Construct (N=130)

OSLQ Construct	<i>M</i>	<i>SD</i>
Goal Setting	3.65	0.66
Environment Structuring	3.59	0.72
Time Management	3.44	0.61
Self-Evaluation	3.41	0.55
Task Strategies	3.38	0.50
Help Seeking	3.36	0.57
Scale Total:	3.49	0.45

Note: Responses on a 5-point scale of 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*.

The second research objective of this study was to describe the level of self-identification by the students enrolled in an online agriculture dual-enrollment course with each of the motivation constructs (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety) as a motivator for them in this class. The motivation scales of the larger MSLQ were used to collect the data from the student participants. These scales were in a 7-point Likert-type scale format with response choices ranging from *not at all true of me* (1) to *very true of me* (7). Of the six motivation constructs, students scored the highest in task value ($M = 5.03$, $SD = 1.07$) and extrinsic goal orientation ($M = 5.02$, $SD = .97$). On the other hand, students were motivated the least by test anxiety ($M = 4.75$, $SD = 1.22$). These data are shown in Table 7.

Table 7. Levels of Self-Identification with MSLQ Motivation Constructs of Online Agriculture Dual Enrollment Students (N = 130)

Motivation Construct	M	SD
Task Value	5.03	1.07
Extrinsic Goal Orientation	5.02	0.97
Control of Learning Beliefs	4.98	1.16
Self-Efficacy for Learning and Performance	4.95	1.10
Intrinsic Goal Orientation	4.87	1.03
Test Anxiety	4.75	1.22

Note: Responses on a 7-point scale of 1 = Not at All True of Me, 7 = Very True of Me.

Research objective three of this study was to describe the strengths of the relationships between each of the motivation constructs of intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety and the students' online self-regulated learning scores.

Using Davis' (1971) scale for describing the strength of numerical correlation values, the results of the Pearson product-moment correlations (r) from this study indicated very strong associations between students' online self-regulated learning and the following motivation constructs: task value ($r = .76$), self-efficacy for learning and performance ($r = .76$), and intrinsic motivation ($r = .74$). According to Davis' categories, extrinsic motivation ($r = .68$) and control of learning beliefs ($r = .63$) were substantially related to online self-regulated learning. All of these relationships were statistically significant at the $p < .001$ level. A low association ($r = .18$, $p < .05$) was found between online self-regulated learning and test anxiety. The correlational data are shown in Table 8.

Table 8. Correlations Among Motivation Constructs and Online Self-Regulated Learning

Variable	Motivation Construct					
	Task Value	Self-Efficacy	Intrinsic Motivation	Extrinsic Motivation	Control Beliefs	Test Anxiety
Online Self-Regulated Learning	0.76**	0.76**	0.74**	0.68**	0.63**	0.18*

* $p < .05$, ** $p < .001$

Conclusions

The first research objective of this study sought to determine the levels of online self-regulated learning of students enrolled in an online agriculture dual-enrollment course. Students in this study scored the highest in the construct of goal setting. This stands in contrast to similar studies

(Chumbley et al., 2015; Davis & Neitzel, 2011) where students scored highest in environment structuring. With the less-structured schedule of traditional face-to-face courses, a conclusion may be made that the students in this online course set immediate and long-term goals to better meet academic goals.

Conversely, students indicated their lowest level of agreement within the construct of help seeking. Through experience in the online environment, students develop the skills to regulate their learning and thus know how to acquire the knowledge needed to be successful in this environment (Cunningham & Billingsley, 2003). The students in this study may not have yet developed those skills and may not know where to seek the information needed to be successful in the course. Therefore, these students should continue to work with their instructors or other trusted individuals to develop the knowledge and skills needed to seek the answers they require to meet their academic goals.

The second research objective was to describe the level of self-identification by the students enrolled in an online agriculture dual-enrollment course with each of the motivation constructs (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety) as a motivator for them in this class. As shown in Table 7, the value of the task and extrinsic factors were the motivation constructs in which students showed the highest levels of agreement. In this case, students viewed the tasks as interesting, important, and useful (Pintrich et al., 1991). Since students in this course viewed the tasks as important and useful, it could be concluded that students were more likely to engage in coursework when it was perceived as helpful to their academic and career goals.

From the high scores in extrinsic motivation, several conclusions may be drawn and warrant investigation. Hartnett et al. (2011) identified patterns of extrinsic motivation and suggested that, while not necessarily a negative thing, students can be motivated to learn by factors other than learning for the sake of learning. Students in this course may have been motivated to engage in course activities simply to earn a good grade or because they felt compelled to learn to please their teacher or family. On the other hand, students may have been motivated by the identified regulation pattern of extrinsic motivation (Hartnett et al., 2011) because they saw the course as simply a component of their academic plan in pursuit of their future career goals.

Research objective three sought to describe the strengths of the relationships between each of the motivation constructs (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, test anxiety) and the students' online self-regulated learning scores. Task value, self-efficacy for learning and performance, and intrinsic motivation had very strong relationships with online self-regulated learning. Substantial relationships existed between online self-regulated learning and extrinsic motivation and control of learning beliefs. Test anxiety had a low relationship with online self-regulated learning.

The findings from the third objective lead to several possible conclusions. Not only did the students identify the highest motivator as task value, but the relationship between task value and online self-regulated learning was very strong. Task value is a pattern of extrinsic motivation that refers to how useful the students view the tasks in the course rather than the reasons why they are completing the tasks (Pintrich et al., 1991). Therefore, to ensure student engagement in coursework, it could be reasonably concluded that faculty should include meaningful tasks that students view as relevant to the course or themselves, personally.

Self-efficacy for learning and performance was also very strongly related to the students' online self-regulated learning scores. The mean online self-regulated learning score among the students in the course was 3.49 out of a possible high score of 5.00, suggesting the students were not highly self-regulated. This does not come as a surprise since the students were not experienced in distance education courses. As self-efficacy for learning and performance refers to one's perceived ability and confidence to perform a learning task (Pintrich et al., 1991), it can be concluded that the students had not yet completed enough online coursework to develop high perceptions of their abilities to succeed in this environment. Since confidence is built on prior experiences, as these students complete future online education activities, they will develop the skills needed to improve their abilities to successfully complete education in this format.

Implications and Recommendations

The findings and conclusions from this study have implications for several stakeholders. First, distance education faculty can use these findings to improve instruction by including relevant educational tasks in their courses. As students are more likely to engage in coursework when they perceive it to be relevant, it is imperative that course developers include meaningful tasks from which students can build their knowledge base.

Faculty and instructors of distance education courses should be proactive with new students regarding the strategies needed to be successful in the online environment. Self-efficacy has been shown to be positively related to student engagement and performance (Pintrich & DeGroot, 1990). Students who believe they are capable are more likely to be self-regulating in terms of metacognitive strategies and are more likely to persist at difficult tasks (Pintrich & DeGroot, 1990). Specifically, students should be provided with examples of resources to consult when information is needed or assistance is required. Furthermore, students should be taught how to analyze their learning through meta-analysis procedures that assess their learning to determine strengths and weaknesses to mitigate the inherent isolation of the online environment. Although the students in this study were not specifically deficient in their ability to manage their time, emphasis should be placed on assisting students in the further development of the skills needed to be more cognizant of the management requirements needed in an online program.

Intrinsic motivation and task value have important relationships with self-regulated learning. Students who are more intrinsically motivated are more likely to be engaged in the coursework and implement more self-regulated processes to manage their learning. Furthermore, students who are intrinsically engaged in the coursework are more interested in the content and view the tasks in which they are engaged as more valuable (Pintrich & DeGroot, 1990). It is recommended that faculty or instructors socialize students' intrinsic value for academics through valuable learning tasks. As teachers implement more valuable learning tasks, students will be more engaged in the course, not necessarily because it will lead to higher grades, but because it may lead to more cognitive engagement in the online environment.

Eccles (1983) indicated that intrinsic motivation was tied to students' choice of future math courses. Additionally, Pintrich and DeGroot (1990) reported that intrinsic value was an important component of students' choice regarding engagement in academic work. As found in this study, intrinsic motivation was very strongly related to online self-regulated learning. This finding is especially important to agricultural education. It is recommended that faculty and instructors in agriculture implement strategies to increase student's intrinsic motivation to learn agriculture concepts by incorporating valuable learning tasks in the online environment to motivate students to pursue additional agriculture coursework. In addition, by incorporating the use of goal setting before and upon the conclusion of an online course, students will be able to complete a self-evaluation of their learning (Chumbley et al., 2015).

Problem-based learning and authentic assessments have been shown to aid in the development of self-regulated learning (Iran-Nejad & Chissom, 1992). As these methods are more practical and engaging to the students, course developers are encouraged to incorporate these methods in the online environment. It is further recommended that researchers investigate the use of problem-based and authentic assessments and their relationship to intrinsic motivation and task value in the online environment. To improve student engagement within the multiplatform nature of hybrid online environments, course developers and researchers are also encouraged to investigate the use of team-based learning approaches within the online environment.

Recently, enrollment in online courses has steadily increased at the secondary and postsecondary levels. Therefore, it would also benefit preservice teachers if teacher educators would implement online course methodology into teaching methods courses. One cannot expect preservice teachers to inherently understand the nuances of teaching online simply because of prior enrollment in distance courses. Including a set of best practices in teacher preparation programs will enable future teachers to develop the skills needed to teach their students in the virtual environment.

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