

# An Exploration of Attitudinal and Situational Factors Related to Intrinsic Motivation and Autonomy in Teacher Education Students

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## Abstract

Teachers who are autonomous in their learning are able to serve as both role models and facilitators of autonomy in their students. Because the manifestation of autonomy in pursuit of individual learning goals often spurs intrinsic motivation, this study used multiple correlation analysis in order to determine how well attitudinal and situational factors in teacher education students ( $N = 320$ ) were related to intrinsic motivation as a proxy measure for learner autonomy. The attitudinal factors used were three components of extrinsic motivation, amotivation, classroom community, school community, and self-esteem; the situational factors were student status (undergraduate or graduate) and course type (online or face-to-face). Study results suggest that the most important factors related to intrinsic motivation are the three types of regulation associated with extrinsic motivation, graduate student status, enrollment in an online course, and self-esteem. In particular, online students were more intrinsically motivated than face-to-face classroom students. Possible explanations for this result are that (a) students with greater levels of intrinsic motivation self-select online versus face-to-face courses or (b) online instructors, course design, and pedagogy are better able to strengthen intrinsic motivation (and, by assumption, learner autonomy) in students.

**Keywords:** teacher education, learner autonomy, motivation, distance education, online learning

## 1. Introduction

Learner autonomy is increasingly recognized as an important characteristic of educators who are able to facilitate their own professional development thereby improving teaching effectiveness (cf. McCarthy & James, 2017; Wagner, 2018). The notion that educators must actively and consistently work towards their professional practice rather than passively waiting for others to catalyze growth provides a new direction for the professionalism of teaching. Similarly, students who leave educational institutions as autonomous learners are better able to serve as positive change agents for lifelong personal and professional development (Ponton & Carr, 2016b). Adequate modeling and facilitation of student autonomy is predicated upon teachers who are themselves autonomous learners.

Self-determination theory (SDT; Deci & Ryan, 1985) suggests that people have an inherent need to choose or self-determine the activities in which they engage. However, for real choice to exist, intrinsic motivation (i.e., motivation catalyzed by personal outcomes such as interest or pleasure) rather than extrinsic motivation (i.e., motivation catalyzed by social outcomes such as money or rewards) must energize and direct action. Satisfaction of the fundamental needs of autonomy, competence, and relatedness to others enhances intrinsic motivation and within the domain of learning these needs are conceptually related to self-esteem, learner autonomy, and sense of community, respectively.

In 1999, Ponton defined learner autonomy as “the characteristic of the person who independently exhibits agency in learning activities” (pp. 13-14). This conceptualization of agency, or intentional behavior, recognizes bidirectional influences between the agent (i.e., the person acting intentionally), the environment, and behaviors (Ponton & Carr, 2012) consistent with social cognitive theory’s reciprocal determinism (Bandura, 1997). SDT addresses autonomy support versus control and hypothesizes that social contexts which support autonomy facilitate self-determined motivation, improved health, and increased performance (Ryan & Deci, 2000). Molden & Dweck (2000) noted that “learning goals are thought to stem from a pure motive to approach success, and as such, should spur intrinsic motivation” (p. 135). Thus, the educational environment can (and should) be designed to enhance intrinsic motivation with associated increases in learner autonomy.

Ryan and Deci (2000) defined intrinsic motivation as “the doing of an activity for its inherent satisfactions rather than for some separable consequence” (p. 56). Research suggests that there is a significant relationship between learner autonomy and intrinsic motivation (e.g., Fazy & Fazy, 2001; Reeve, Bolt, & Cai, 1999). The conceptual linkage between these two constructs rests on the notion that individuals who learn for intrinsic reasons (e.g., the joy of learning or a personal commitment to learning) are more likely to engage in autonomous learning activities. Thus, intrinsic motivation influences autonomous learning tendencies.

In contrast, extrinsic motivation refers to the performance of an activity in order to obtain a socially constructed outcome (e.g., diploma, money, praise, or reward). Studies suggest that teachers who support their students’ autonomy also help their students develop increased levels of intrinsic motivation, curiosity, and the desire for challenge (e.g., Ryan & Grolnick, 1986). In contrast, studies suggest that students who are excessively controlled by external

forces have decreased initiative and learn less productively especially when complex learning requiring creative or conceptual processing is required (Benware & Deci, 1984; Grolnick & Ryan, 1987).

Researchers (e.g., Little, 1995) describe the importance of the autonomy of teachers as learners themselves. Sinclair, McGrath, and Lamb (2000) suggested that the literature on learner autonomy can inform a new focus within teacher education by contending that the development of autonomy within students is dependent upon autonomous teachers. They suggested that to expect teachers who are not autonomous in their own learning to foster learner autonomy in their students is unreasonable. The behavior of teachers in the classroom is largely shaped by their attitudes (“you are yourself, in some sense, what you teach”; Salmon, 1995, p. 28); therefore, one can conclude a need to foster learner autonomy in teachers and, a priori, teacher education students so that they become better equipped to build learner autonomy in their students.

Teachers cannot assume that students as learners will know how to learn independently. To assist learners to take greater control over their own learning, it is important to increase their awareness of requisite cognitive strategies some of which they may already be using (Holmes & Ramos, 1991). Developing the knowledge and personal qualities of students as learners will be contingent upon developing the learner autonomy of teachers. Moreover, Moore (1994) suggested that learner autonomy should be a developmental goal of distance education. He argued that distance educators should consider it a benefit if their students were more autonomous and, as a consequence, design methods of encouragement and support via course design and instruction.

### *1.1 Research Purpose*

The purpose of this study was to determine how a set of variables are related to intrinsic motivation—as a proxy measure for learner autonomy—in a higher education sample of teacher education students. The variables included (a) attitudinal factors of extrinsic motivation, amotivation, sense of community, and self-esteem, and (b) situational factors of student status (undergraduate or graduate) and course type (online or face-to-face).

## **2. Literature Review**

### *2.1 Self-determination Theory*

Early applications of SDT often approached intrinsic and extrinsic motivation from a dichotomous perspective (Vallerand & Fortier, 1998); however, Ryan and Deci’s (2000) extensions of SDT have emphasized motivation as a self-regulatory process that exists on a continuum, anchored at one end by the concept of intrinsic motivation that energizes and directs intentional action such as autonomous learning and at the opposite end by amotivation or behavior that is nonintentional and nonregulated with extrinsic motivation residing in the middle. Amotivation arises when an individual ascribes no value to a given activity because of feelings of incompetence to engage in a successful performance or not believing that even

a successful performance would yield a desirable outcome (Ryan, 1995). Consequently, amotivated students have little reason to engage in education and are likely to become dropouts either directly or figuratively. Research (e.g., Calder & Staw, 1975) suggests that the initial level of interest in a task is critical; one should not reward a behavior if intrinsic interest is already high as it may decrease intrinsic motivation. However, if interest is low, using extrinsic reinforcement may increase interest, develop intrinsic motivation, and reduce amotivation. This interest can be tied to the type of goal pursued by the student (i.e., performance, ability, ego or mastery, learning, and task) and evoke different forms of motivation that influence self-regulatory mechanisms.

Between intrinsic motivation and amotivation rests extrinsic motivation. This type of motivation is described by the pursuit of a socially supplied outcome external to the agent and can vary in the degree of manifest autonomy (Ryan & Connell, 1989). On a continuum from highest to lowest level of self-determination are the following three types of extrinsic regulation: identified, introjected, and external. Identified regulation—the most self-determined—occurs in education when the student engages in learning because he or she has personally chosen to do so based upon an internalization or personal adoption of the value associated with the extrinsic rewards of the activity (Vallerand et al., 1992). Introjected regulation, an ego form of motivation, is driven by a concern for what others might think and can motivate actions to avoid guilt or anxiety; thus, internalization may not be fully present. Partially internalized motives may be experienced as internally coercive if the motive is in conflict with other aspects of the self-concept. External regulation—the least self-determined—is based on socially-constructed pressure or rewards such as a work promotion or a course grade (Vallerand et al., 1992).

Learner autonomy is associated with intrinsic motivation from the perspective that this form of motivation supports personal needs and interests, skill development, and agency (i.e., intentionality) in the learning process (Deci & Ryan, 1985; Ushioda, 1996). Consequently, engaging learners' intrinsic motivational processes plays a significant role in strengthening their autonomy. Because autonomous learning is agentic (Ponton & Carr, 2016a), learners need to be able to have some choices regarding learning and should feel responsible for their own learning. Intrinsically motivated students show greater levels of interest, efficacy, excitement, perseverance, accomplishment, and conceptual understanding of that being studied as compared to students who experience high levels of external control (Deci & Ryan, 2000a).

Research on classrooms with high levels of teacher control (e.g., Miserandino, 1996) suggest that such control weakens students' sense of autonomy, decreases intrinsic motivation, and results in poor attitudes as well as decreased performance; thus, extrinsic motivation through the use of contingent rewards (i.e., external regulation) may conflict with intrinsic motivation. The outcome is either an increased reliance on extrinsic motivation predicated upon continued rewards or coercion or amotivation that threatens persistence. High intrinsic motivation relative to extrinsic motivation has consistently been linked to reduced student attrition, deeper thinking, increased student success, and greater wellbeing (e.g., Black & Deci, 2000; Williams et al., 2004).

Based on the above views of motivation it is hypothesized that either a direct or inverse relationship exists between intrinsic motivation and extrinsic motivation, depending on the degree to which external factors have been internalized by the learner. Greater internalization should result in a direct relationship. It is also hypothesized that an inverse relationship exists between intrinsic motivation and amotivation since they represent opposite ends of the internalization continuum.

### *2.2 Sense of Community*

Sense of community is another attitudinal factor theoretically related to intrinsic motivation. Sense of community is “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). Rovai, Wighting, and Lucking (2004) suggested that sense of community as applied to an educational setting is comprised of two dimensions: social and learning. Based primarily upon McMillan and Chavis’s (1986) work, the social dimension encompasses student feelings of their community with respect to belonging, cohesion, interactivity, interdependence, safety, spirit, and trust. The learning dimension consists of student feelings with respect to the level of sharing group norms and values and the degree to which educational goals and expectations are satisfied by community membership.

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) posits relatedness to others (cf. sense of community) is a basic learner need. Research (e.g., Furrer & Skinner, 2003) provides evidence to suggest students’ sense of community fosters the development of intrinsic motivation. Deci and Ryan (2000b) theorized that socialization can allow the development of inner values even in an environment of external regulation when students act in self-determined ways. Successful academic programs incorporate social contexts that support the development of intrinsic motivation and internalization of external regulations. A strong community helps students meet their basic needs for affiliation by providing students with a voice in shaping their environment, positive connections with peers and teachers, and opportunities for contribution and meaningful learning. Accordingly, it is hypothesized that learners with strong sense of community will also have higher intrinsic motivation.

### *2.3 Self-Esteem*

Self-esteem is the final attitudinal factor considered in this study. Rosenberg (1965) defined self-esteem as an attitude toward the self. SDT suggests that positive self-esteem helps satisfy the basic student need of possessing a sense of competence (Deci & Ryan, 1985; Ryan & Deci, 2000). According to Brown, Dutton, and Cook (2001), self-esteem reflects how individuals evaluate themselves thus creating an identity standard. Beane and Lipka (1984) reported that self-esteem is related to the school environment and that it flourishes in schools where students feel a sense of belonging to a valued group, student membership is recognized and acknowledged, and students feel a sense of ownership of both the school and its programs. When individuals encounter stress, self-esteem sustains them while they work to restore their identity standard (Burke, 1996). Over time, students with a positive self-esteem will study harder so that a better grade is earned on the next assignment thereby affirming

their identity standard.

Deci, Vallerand, Pelletier, and Ryan (1991) suggested that when teachers are noncontrolling and nonpressuring, students have both higher intrinsic motivation and self-esteem than with controlling and pressuring teachers. When teachers use self-esteem contingencies such as “you might feel better about yourself if you study harder,” they undermine intrinsic motivation by introducing a perceived external locus of causality for engaging in learning (Ryan, 1982). For this study, it is hypothesized that learners with high self-esteem will have higher intrinsic motivation.

#### *2.4 Situational Factors*

In addition to the attitudinal factors identified, situational factors may also be related to intrinsic motivation such as undergraduate versus graduate status and online versus face-to-face instructional delivery. It is hypothesized that graduate students are more likely to be motivated by internal factors due to the theorized developmental nature of intrinsic motivation in postsecondary education. Graduate students, having experienced undergraduate education, may have a tendency to engage in advanced studies for the inherent satisfaction or personal challenge of learning rather than for the mere acquisition of another degree. In contrast, undergraduate students may be more motivated to earn a degree by external factors such as family expectations or the job market. Ponton and Carr (2016b) showed that learner autonomy (conceptualized as desire, resourcefulness, initiative, persistence, and self-efficacy) is positively related to the level of education completed.

It is also hypothesized that students engaged in online learning are more likely than students in face-to-face classrooms to be intrinsically motivated because of factors such as the intellectual challenge of distance learning via computer technology and higher required levels of manifest learner autonomy. According to Zhang (1998), distance education creates a learning environment that “emphasizes intrinsic motivation and self-sponsored curiosity and creative situated learning” (p. 4). These findings are supported by research in distance education that suggests a relationship of intrinsic motivation with persistence as well as with achievement (Coussement, 1995; Dill & Mezach, 1991).

### **3. Method**

#### *3.1 Participants*

Students ( $n = 320$ ) from three universities enrolled in either face-to-face ( $n = 165$ ;  $P = 51.6\%$ ) or online courses ( $n = 155$ ;  $P = 48.4\%$ ) were volunteer participants for this study. The universities were fully accredited and located in a single urban area in the state of Virginia (United States). Twelve online and 12 face-to-face courses were sampled with each university contributing both online and face-to-face participants. One hundred and forty-one ( $P = 44.1\%$ ) attended a private, secular university; 101 ( $P = 31.6\%$ ) attended a private, Christian university; and 78 ( $P = 24.3\%$ ) attended a public university. There were 209 ( $P = 65.3\%$ ) undergraduate and 111 ( $P = 34.7\%$ ) graduate (i.e., postbaccalaureate) students. The sample

included 272 ( $P = 85.0\%$ ) females and 48 ( $P = 15.0\%$ ) males, which is a gender disparity typically found in education programs. The participants by ethnicity was as follows: 189 ( $P = 59.1\%$ ) White, 93 ( $P = 29.0\%$ ) African American, and 38 ( $P = 11.9\%$ ) Other. By age, the sample included of 33 ( $P = 10.3\%$ ) 18-20 year olds, 143 ( $P = 44.7\%$ ) 21-30 year olds, 94 ( $P = 29.4\%$ ) 31-40 year olds, 40 ( $P = 12.5\%$ ) 41-50 year olds, and 10 ( $P = 3.1\%$ ) over 50 years old.

### 3.2 Setting

All courses lasted an entire single semester and were either offered in a traditional classroom on the main campus or at a distance via the internet using a learning management system that enabled instructors to design, facilitate, and assess instruction. Online students lived throughout the United States; face-to-face students either lived in campus dormitories or commuted. For undergraduate courses, course titles included teaching methods, geometry for teachers, and classroom management; for graduate courses, titles included school law, special education, and middle school administration.

### 3.3 Instrumentation

This study used three self-report instruments to measure academic motivation, community, and self-esteem. All instruments including demographic questions (i.e., measures of gender, ethnicity, and age) were administered during the final 3 weeks of the course to ensure substantial course exposure.

The 28-item Academic Motivation Scale-College (AMS-C 28) was used to measure amotivation, intrinsic motivation, and extrinsic motivation (Vallerand et al., 1992). In response to the question “Why do you go to college?” each item represents a reason (e.g., “Because I experience pleasure and satisfaction while learning new things”) and participants are asked to provide their level of correspondence to the reason using a 7-point Likert scale ranging from 1 (*Does not correspond at all*) to 7 (*Corresponds exactly*). Four items address amotivation, 12 address intrinsic motivation, and 12 address the following three subscales (four items per subscale) of extrinsic motivation: identified regulation, introjected regulation, and external regulation. Thus, maximum score ranges are as follows: amotivation, 4 to 28; intrinsic motivation, 12 to 84; and each extrinsic motivation subscale, 4 to 28. Higher scores reflect greater amotivation or stronger motivation depending upon the construct. In this study, internal consistency was supported with overall AMS-C 28 reliability at Cronbach’s  $\alpha = .91$ ; amotivation, intrinsic motivation, and extrinsic motivation  $\alpha$  values were .91, .93, and .89, respectively.

The Classroom and School Community Inventory (CSCI) was used to measure classroom and school community (Rovai et al., 2004). This instrument consists of 10 items to measure classroom community (e.g., “I trust others in this course”) and 10 for school community (e.g., “I share the educational values of others at this school”) using a 5-point Likert scale to measure agreement (i.e., *strongly agree*, *agree*, *neutral*, *disagree*, and *strongly disagree*). The maximum score range for each community scale is 0 to 40 with higher scores indicating a stronger sense of community. For this study, internal consistency was supported for

classroom and school community by  $\alpha$  values of .84 and .85, respectively.

The Rosenberg (1965) Self-Esteem Scale (SES) was used to measure global self-esteem. The SES consists of 10 statements regarding feelings of self-worth or self-acceptance (e.g., “I feel that I’m a person of worth, at least on an equal plane with others”) and uses a 4-point Likert scale to measure agreement from *strongly agree* to *strongly disagree*. The maximum score range is 0 to 30 with higher scores indicative of stronger self-esteem. In this study, coefficient  $\alpha$  was .88 thereby supporting internal consistency.

### 3.4 Design and Data Analysis

This study used a correlational design to address the following question: How is a linear combination of integrated regulation, introjected regulation, external regulation, amotivation, classroom community, school community, self-esteem, enrollment in an online course, and graduate student status related to intrinsic motivation? Enrollment in an online course and graduate student status are dummy variables created from course type (online, face-to-face) and student status (undergraduate, graduate). Stepwise multiple correlation analysis using forward entry of independent variables was employed to analyze the data.

## 4. Findings

Table 1 displays descriptive statistics for pooled data as well as by course type and student status. The dummy variable “enrollment in an online course” applies to 48% of the sample and the dummy variable “graduate student status” represents 35% of the sample. Bivariate correlation coefficients are displayed in Table 2.

**Table 1.** Descriptive Statistics by Course Type, Student Status, and Total ( $N = 320$ )

Variable	Course type				Student status				Total	
	Online		Face-to-face		Graduate		Undergraduate		<i>M</i>	<i>SD</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1.Amotivation	6.45	5.45	5.88	3.98	5.34	3.98	6.58	5.07	6.15	4.75
2.Classroom community	27.10	5.21	29.13	6.55	30.99	6.02	26.64	5.45	28.15	6.01
3.External regulation	20.07	6.26	20.42	5.95	18.86	6.24	20.99	5.90	20.25	6.09
4.Identified regulation	23.23	5.24	22.28	4.71	22.08	5.26	23.09	4.82	22.74	4.99
5.Intrinsic motivation	61.10	14.00	54.02	15.46	59.41	14.42	56.41	15.49	57.45	15.17
6.Introjected regulation	19.88	6.36	19.13	6.44	18.40	6.68	20.07	6.19	19.49	6.40
7.School community	25.80	6.49	27.75	6.33	28.45	6.06	25.93	6.53	26.80	6.47
8.Self-esteem	24.33	4.68	24.63	4.89	24.84	4.95	24.30	4.69	24.48	4.78



**Table 2.** Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10
1. Amotivation	–	-.21	ns	-.11	-.34	-.20	ns	-.13	ns	-.15
2. Classroom community		–	-.17	ns	ns	.14	ns	.35	.51	ns
3. Enrollment in an online course			–	ns	ns	.23	ns	ns	-.15	ns
4. External regulation				–	.63	.32	.49	-.17	ns	ns
5. Identified regulation					–	.57	.56	ns	.12	ns
6. Intrinsic motivation						–	.66	ns	.21	.17
7. Introjected regulation							–	-.13	.17	.10
8. Graduate student status								–	.19	ns
9. School community									–	.25
10. Self-esteem										–

Note.  $p < .05$ ; ns = not significant.

**Table 3.** Regression Results: Predicting Intrinsic Motivation ( $N = 320$ )

	Variable	<i>b</i>	<i>SE b</i>	$\beta$
Step 1	Introjected regulation	1.56	.10	.66
Step 2	Introjected regulation	1.18	.12	.50
	Identified regulation	.87	.15	.29
Step 3	Introjected regulation	1.22	.11	.52
	Identified regulation	.90	.14	.29
	Graduate student status	5.95	1.25	.19
Step 4	Introjected regulation	1.22	.11	.51
	Identified regulation	.85	.14	.28
	Graduate student status	5.96	1.21	.19
	Enrollment in an online course	5.43	1.14	.18
Step 5	Introjected regulation	1.28	.11	.54
	Identified regulation	1.07	.16	.35
	Graduate student status	5.55	1.20	.17
	Enrollment in an online course	5.05	1.14	.17
	External regulation	-.34	.12	-.14
Step 6	Introjected regulation	1.26	.11	.53
	Identified regulation	1.07	.16	.35
	Graduate student status	5.32	1.19	.17
	Enrollment in an online course	5.16	1.13	.17
	External regulation	-.35	.12	-.14
	Self-esteem	.33	.12	.10

Note.  $R^2 = .43$  for Step 1;  $\Delta R^2 = .06$  for Step 2;  $\Delta R^2 = .03$  for Step 3;  $\Delta R^2 = .03$  for Step 4;  $\Delta R^2 = .01$  for Step 5;  $\Delta R^2 = .01$  for Step 6 ( $ps < .05$ ).

A stepwise multiple correlation analysis using forward entry of independent variables was conducted to evaluate how well they are related to intrinsic motivation. Table 3 provides a summary of the results. Tests of assumptions were satisfactory: the Durbin-Watson statistic of 2.05 suggests the absence of serial correlation of error terms for adjacent cases, and an examination of eigenvalues and variance proportions suggests no multicollinearity problems. The stepwise multiple correlation solution indicates that the linear combination of introjected regulation, identified regulation, graduate student status, enrollment in an online course, external regulation, and self-esteem were significantly related to intrinsic motivation,  $F(6, 313) = 70.97, p < .001$ . At the final step  $R = .76, R^2 = .58$ , and adjusted  $R^2 = .57$ . Classroom community, school community, and amotivation were unable to explain additional intrinsic motivation variance in the statistical model.

## 5. Discussion

Findings provide evidence that the following variables, in order of importance, were significantly related to intrinsic motivation: introjected regulation, identified regulation, graduate student status, enrollment in an online course, external regulation, and self-esteem. Together these variables account for approximately 58% of intrinsic motivation variance in the sample.

### 5.1 Extrinsic Motivation

All three components of extrinsic motivation were significantly related to intrinsic motivation. Introjected regulation was the most important variable followed by identified regulation, which was 66% as important as introjected regulation. External regulation was 26% as important as introjected regulation. The negative beta weight of external regulation indicates an indirect relationship with intrinsic motivation while the positive beta weights of introjected regulation and identified regulation suggest that increases in these two types of regulation are related to an increase in intrinsic motivation.

These findings suggest that the level of intrinsic motivation of the students in this study was strengthened by their belief that participation in the teacher education program will lead to extrinsic rewards of personal value to them (i.e., identified regulation) and how others regard them based on their enrollment in the program (i.e., introjected regulation). This finding is consistent with the theory of reasoned action (TRA) that asserts an agent will develop a behavioral intention if (a) the agent believes the behavior will lead to positive outcomes and (b) the agent believes the behavior to be important to others whose opinion the agent values (Ajzen & Fishbein, 1980). The observed direct relationship between intrinsic motivation, introjected regulation, and identified regulation can be explained by at least two causal arguments when grouping both forms of extrinsic regulation together; that is, extrinsic motivation via introjected/identified regulation may foster intrinsic motivation (Path 1) or intrinsic motivation may foster these forms of extrinsic motivation (Path 2).

Path 1 can be explained by the person who initially begins participation in a learning activity via extrinsic motivation (specifically via introjected/identified regulation) but then begins to

enjoy and become interested in the activity on a personal level. To facilitate this motivational transformation, facilitators of autonomous learners should help students to understand how continuous learning satisfies the expectations of important reference groups (e.g., parents, teachers, colleagues, friends, employers) and why other extrinsic outcomes of personal value (e.g., diploma, money) are realizable via autonomous learning activities. Such facilitation would occur first in teacher education programs and then modeled by graduates (i.e., future teachers) to children. Of course fostering subject matter interest and creating satisfying educational experiences is also necessary for the student to internalize the relationship between intrinsic and extrinsic motivation via introjected/identified regulation; however, Path 1 suggests that initializing participation in learning via introjected/identified regulation will create the opportunity for interest and enjoyment to grow.

Path 2 is also plausible when an intrinsically motivated learner begins to consider additional benefits to the learning activity. For example, an individual who is personally interested in studying computer-related subjects may also realize that such an interest may lead to others holding them in higher esteem (i.e., introjected regulation) and monetary gain (i.e., identified regulation); however, it was interest that first motivated the learning. Nevertheless, total motivation is increased when both introjected and identified regulations are present thereby supporting their importance. Returning to the classroom example in the Path 1 discussion, facilitators of autonomous learners should inform students of introjected and identified regulation considerations (i.e., value of the activity to others and to self) so that students who are initially interested in learning are also equipped with the knowledge that informs enhancements of extrinsic motivation.

Regardless of which causal path is the most dominant (and from the correlation analysis it is impossible to determine), total motivation to engage in autonomous learning is supported when the learner is able to be both intrinsically motivated and extrinsically motivated via introjected/identified regulation. Facilitators of autonomous learners, which can be either instructors of future teachers or K-12 teachers themselves, can enhance total motivation when considerations related to introjected and identified regulation are part of the instructional strategy. However, because K-12 teachers must first complete a teacher education program before employment, the development of learner autonomy should be a primary educational objective in teacher education programs. After graduation, these teachers can not only model the characteristics of autonomous learners but also invoke similar motivational processes to their students. In addition, as autonomous learners these teachers will be better able to elicit motivational inducements for their continued professional development thereby enhancing their teaching processes.

The negative relationship between intrinsic motivation and external regulation suggests that the usage of pressure or rewards that are not internalized by the student may be unnecessary or detrimental to fostering intrinsic motivation. In a causal model where intrinsic motivation precedes extrinsic motivation via external regulation, a learner who is interested and enjoys learning (i.e., high intrinsic motivation) may discount the presence of attempted environmental control (i.e., low extrinsic motivation via external regulation); thus, the presence of such control is unnecessary. In a second causal model where extrinsic motivation

via external regulation precedes intrinsic motivation, a learner who is participating in a learning activity based upon external mandate (i.e., high extrinsic motivation via external regulation) is less likely to be interested in or enjoy the learning (i.e., low intrinsic motivation); thus, the presence of such control is detrimental. The results of the present investigation suggest that facilitators of autonomous learners should avoid external regulation.

This negative relationship between intrinsic motivation and external regulation is consistent with the theory of planned behavior (TPB; Ajzen, 1991). In this extended formulation of TRA, TPB asserts that the formation of behavioral intentions is also subject to the agent's perceived control over the targeted behavior. Thus, the presence of external regulation (i.e., external control) may serve as an inhibitory force that limits perceived volitional control. If this occurs, the development of behavioral intentions in the absence of external control (i.e., via intrinsic motivation) would be less likely.

### *5.2 Graduate Student Status*

Being a graduate student versus an undergraduate student was 32% as important as introjected regulation, the most important independent variable. Recent statistics (National Center for Education Statistics, 2018) indicate that 66.7% of 16-24 year-olds in the United States enrolled in postsecondary education within one year of either graduating from high school or passing the General Educational Development test (i.e., a high school equivalency exam). Thus, although compulsory education ends with high school, it is still rather typical for students to continue to college in a very short period after high school level achievement. In this regard, extrinsic motivation (e.g., societal expectations or rewards) rather than intrinsic motivation (e.g., personal interest or self-standards) may explain undergraduate matriculation and a weaker internal regulation of motivation. Following a discretionary continuum, graduate school is likely still considered to be even more optional than undergraduate school based upon fewer numbers of students who attempt to continue on to this level of education. Thus, a positive relationship between intrinsic motivation and level of education is expected. Because a student who perceives personal competence in his or her ability to successfully complete educational programs is more likely to continue to higher levels of education, the strengthening of academic self-efficacy to enhance motivation is an important educational outcome to encourage.

### *5.3 Enrollment in an Online Course*

Being an online versus a face-to-face student was 32% as important as introjected regulation to intrinsic motivation. A possible explanation of this finding is that students—new or continuing—with greater levels of intrinsic motivation select online courses instead of face-to-face courses. Although participation in online courses continues to increase, not all students enroll in such courses; thus, online students are still considered to be innovative early adopters with characteristics that differ from mainstream others (Rogers, 1995).

Rogers' (1995) diffusion of innovation theory suggests that those who embrace new innovations (i.e., the first 15% of adopters) differ from later adopters in that they tend to have

higher intelligence, greater comfort with change, greater ability to deal with uncertainty, more favorable attitude toward science and technology, more social participation, and a more interconnected personal network. Relevant to this study, Rogers stated that when compared to later adopters, earlier adopters “have higher aspirations (for formal education, occupations, and so on)” (p. 274) and more actively pursue information regarding the innovations themselves. These differential characteristics support the finding of online students manifesting higher levels of intrinsic motivation than face-to-face students. As participation in online education continues to grow, such differences must continue to be examined.

Expectancy value theory (Atkinson, 1982; Vroom, 1964) asserts that people choose to engage in activities perceived to lead to valued outcomes; thus, students choose online over face-to-face courses when they anticipate greater levels of satisfaction by so doing. Because of the mediating role of self-efficacy in cognitive motivation (cf. Bandura, 1997), students may also choose online courses because they perceive themselves to be more capable of being successful in this form of instruction than in face-to-face classes. Although the mediating role of self-efficacy has been found in many domains of human activity (Bandura, 1997), future research in postsecondary education should be performed to support this assertion.

Another possible explanation for online students having higher levels of intrinsic motivation than face-to-face students is that online instruction facilitates such motivation. This view is supported by Zhang (1998) who stated that e-learning “emphasizes intrinsic motivation and self-sponsored curiosity and creative situated learning” (p. 4). In addition, online instruction may also offer avenues of increasing perceived competence in performance that enhances intrinsic motivation, which is consistent with cognitive evaluation theory (Deci & Ryan, 1985) that asserts intrinsic motivation is enhanced when people feel competent (cf. self-efficacy) and self-determined in their actions. Ryan and Deci (2000) stated that “interpersonal events and structures (e.g., rewards, communications, feedback) that conduce toward feelings of competence during action can enhance intrinsic motivation for that action because they allow satisfaction of the basic psychological need for competence” (p. 58).

#### *5.4 Self-Esteem*

The present research supports a limited but significant role of self-esteem in explaining intrinsic motivation variance. Self-esteem was the least important predictor of intrinsic motivation (19% as important as introjected regulation). High motivation comes from anticipations of a successful performance and valued outcomes associated with such a performance. When the learning environment enhances these anticipations, self-esteem and intrinsic motivation should both increase (Ehrman & Oxford, 1995). Researchers such as Wiest, Wong, and Kreil (1998) support this view by reporting that intrinsic satisfaction is related to high self-esteem in performing meaningful, important activities. Brooks (1992) reported that self-esteem in students directs and motivates their behavior. The outcomes of these behaviors in turn influence self-esteem so that a dynamic reciprocity is continuously occurs. For example, low self-esteem is likely to lead to reduced motivation and poor performance thereby confirming the learner’s self-perception as a weak learner and, thus,

leading to even lower motivation and achievement. This study provides limited empirical support for these processes that require further investigation.

### *5.5 Nonsignificant Variables*

Sense of community (classroom and school) and amotivation were unable to explain additional intrinsic motivation variance in this study above the significant variables already discussed. The nonsignificant role of sense of community was not expected as it is identified as one of the three student needs in SDT, and the benefits of a strong learner community are well established in the professional literature. The more strongly students bond to a school and to each other, the more they should internalize the school's norms and goals. Moreover, they should feel that they are valuable, contributing members of a classroom or school where everyone is dedicated to the welfare and learning of all members of the community. Students who have a strong sense of community tend to have a more positive attitude toward themselves (e.g., higher self-esteem) and to the school (e.g., enjoy learning more). Indeed, this study showed significant positive bivariate relationships between classroom community and intrinsic motivation and between school community and intrinsic motivation, extrinsic motivation, and self-esteem. These relationships suggest that the relationship between sense of community and intrinsic motivation is mediated by extrinsic motivation and self-esteem.

### *5.6 Limitations*

Causal inference cannot be addressed in this correlational study. Moreover, this study did not control teachers' orientation toward control versus autonomy in the classroom setting nor did it measure learner self-efficacy. In particular, this study should be replicated and extended to address the role of teacher orientation in order to determine how teacher orientation influences student intrinsic motivation and achievement. In addition, instead of proxy measures, direct measures of learner autonomy (e.g., the Learner Autonomy Profile; Ponton, Carr, Schuette, & Confessore, 2010) should be considered for future research.

## **6. Conclusions and Recommendations**

Teachers should facilitate students' development of cognitive strategies and positive affect while learning new knowledge or skills. Specifically, students need assistance in developing learner autonomy, and teachers should play an important role in providing this assistance (Sinclair et al., 2000). Little (1995) asserted that teachers must be autonomous learners in order to do so. The relationship between intrinsic motivation and learner autonomy (e.g., Fazey & Fazey, 2001; Reeve, Bolt, & Cai, 1999) suggests the need to foster intrinsic motivation in teachers if they are expected to support the development of learner autonomy in their students. The development of intrinsic motivation can and should occur while teachers are still teacher education students.

Learning behaviors are likely driven by a blending of intrinsic and extrinsic motivations. In this study the most important predictors of intrinsic motivation in teacher education students, in order of importance, were introjected regulation, identified regulation, graduate student

status, enrollment in an online course, external regulation, and self-esteem. The role of extrinsic motivators in predicting intrinsic motivation provides evidence of the importance of both internal and external reinforcement in academic motivation. By recognizing and balancing both extrinsic and intrinsic reinforcement, perhaps educators can better nurture the motivational systems in students. Fostering total motivation (i.e., intrinsic plus extrinsic) to engage in autonomous learning among students, whether they are future teachers or children, requires facilitators to use introjected and identified regulation and minimize the use of external regulation.

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