

## Mediating Role of Intrinsic motivation: Needs Satisfaction and Student Engagement of Undergraduate Students

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The purpose of the study was to investigate intrinsic motivation as a mediator between basic needs satisfaction and student engagement for undergraduate college students. According to the self determination theory (Deci & Ryan, 2000a), intrinsic motivation is the inherent drive to complete a task and is the most important type of motivation. The self determination theory postulates that the satisfaction of the basic needs: autonomy, competence, and relatedness, leads to autonomous forms of motivation which are responsible for better academic performance. 120 undergraduate students (52 males and 68 females) participated in the study and responded to the basic needs satisfaction-general (BPNS), academic motivation scale (AMS) and university student engagement inventory (USE-I) scales. The results were computed using correlation and regression analyses. The results indicated that intrinsic motivation mediated the relationship between basic needs satisfaction and student engagement. Implication of the study indicates the need for development of needs supportive environments which can be beneficial in the development of intrinsic motivation and engaged behaviour.

**Keywords:** Motivation, Needs Satisfaction, Student Engagement, College Student, Self Determination Theory

A survey conducted in India by the National Sample Survey Organisation (2009-10) concluded that the number of individuals enrolled in higher education has increased from the previous decade, but the overall attendance of students remains low - 19% for boys and 8% for girls in rural areas and 33% for boys and 24% for girls in urban areas. A major reason cited for such low overall attendance is attributed to the larger portion of adults aged 20-24 dropping-out of higher education to start earning early (Varmal, 2013). There exists a need to understand the reasons behind regular attendance behaviour and use this information to build strategies targeting the increase in attendance percentages of other students with low attendance or dropout prevention. Attendance is one of the behavioural features of an engaged student while good attendance records are often cited as signs of intrinsic motivation and satisfaction of basic needs (Deci & Ryan, 2000b).

Engagement is a state of active involvement in self-fulfilling activities which lead to the enhancement of one's efficacy (Maslach

& Jackson, 2008). Student engagement in academic activities is associated with interest, enjoyment, and attention in classroom activities (Claxton, 2007). It refers to the involvement of students in the social environment of a school/college and their active participation in the learning processes within the classroom (Fredricks, Blumenfeld, & Paris, 2004; Reschly & Christenson, 2012). In effect, student engagement is associated with three major dimensions - behavioural, emotional, and cognitive (Dynarski, Clarke, Finn, Rumberger, & Smink, 2008). The behavioural dimension is related to attendance, completion of work, and participation in the classroom (Alexander, Entwisle, & Horsey, 1997), the cognitive dimension is related to involvement in challenging tasks, goal setting and an effort to understand difficult ideas (Kuh, 2004) and the emotional dimension is related to student enthusiasm, relationships with peers and teachers, and interest in the activities (Umbach & Wawrzynski, 2005).

Various studies have found student engagement to positively associated with academic performance, intrinsic motivation,

extrinsic motivation, learning outcomes, and dropout prevention (Carini, Kuh, & Klein, 2006; Froiland & Worrell, 2016; Reeve & Lee, 2014). Student engagement levels differ for successful and unsuccessful students (Reschly & Christenson, 2012), making it an essential component of student assessment. Most research studies have focused on student engagement with respect to the school population, however, it is essential to understand student engagement and its relationship with students in higher education as well.

### **Motivation and Student Engagement**

Research on engagement has predominantly used the socio-contextual lens of the self-determination theory (SDT) (Deci & Ryan, 2000a), specifically the conceptualization of motivation within the SDT framework, to understand domains such as sports, work, and academics. SDT (Deci & Ryan, 2000a) divides motivation into a continuum, where the least autonomous type of motivation is amotivation and the most autonomous type is intrinsic motivation (Vallerand, et al., 1992). Intrinsic motivation is the inherent desire of an individual to complete a task, not requiring any external rewards. SDT gives emphasis to intrinsic motivation as the most important form of motivation. Several studies have primarily focused on the effects of intrinsic motivation on any academic related activity and found positive relationship between the variables (Teixeira, Carraçal, Markland, Silva, & Ryan, 2012).

In an educational set up, all students cannot be intrinsically motivated and educators use extrinsic motivators such as rewards and punishments to effectively engage a student in a classroom (Saeed & Zyngier, 2012). To perform better academically both intrinsic and extrinsic motivation are important predictors of student engagement levels (Jang, 2008). However, studies have found that intrinsically motivated students are more engaged in learning as compared to extrinsically motivated students and are more proficient and competent in completion of their assigned work (Saeed & Zyngier, 2012). In contrast, amotivation has a negative relationship with engagement and performance (Podlog, et al., 2015).

### **Needs Satisfaction, Motivation and Student Engagement**

According to the SDT, the motivational state of an individual is dependent upon the satisfaction or thwarting of three basic psychological needs- autonomy, competence, and relatedness (Deci & Ryan, 2000b). Autonomy is the need of an individual to behave in ways that is acceptable to them. Competence is the desire of the individual to control and master a particular behaviour, ability or performance and its outcomes. Relatedness is the degree to which an individual relates to the social situation around them. Satisfaction of the three needs leads to more autonomous type of motivation- intrinsic motivation, while the thwarting of these needs would lead to more controlled type of motivation- amotivation (Edmunds, Ntoumanis, & Duda, 2006; Vansteenkiste et al., 2007).

According to the SDT, the three basic needs are universal and an individual is constantly moving towards their satisfaction (Deci & Ryan, 2000b). Student autonomy and relatedness have been found to be positively associated with student intrinsic motivation (Malu & Reddy, 2016). According to the cognitive evaluation theory, satisfaction of the need of autonomy and competence is vital for the development of the intrinsic motivation (Ryan & Deci, 2000).

The SDT further postulates that the basic needs exert a effect on variables such as engagement, academic performance and well-being (Deci & Ryan, 2000a; Gagné, Ryan, & Bargmann, 2003). Autonomy, competence and relatedness have been found to have a significantly positive relationship with student engagement. Autonomy supportive environments created by teachers play an important role in increasing the engagement level of students (Jang, Reeve, Ryan, & Kim, 2009). Satisfaction of the need for competence is associated with increase in the levels of engagement (Newmann, Wehlage, & Lamborn, 1992). Relatedness with peers and teachers has been found to be essential for a student to feel engaged in any classroom activity (Furrer & Skinner, 2003). Niemiec and Ryan (2009) reviewed several studies of the various tenets of the SDT and academic engagement to provide further validation of the positive association between basic needs and student engagement.

This study aimed to understand the antecedents of student engagement in higher education by using a model suggested by Podlog et al (2015), where intrinsic motivation was the mediator between basic needs and student engagement.

### **Hypotheses**

1. Needs satisfaction would be positively associated with (i) intrinsic motivation and (ii) student engagement
2. Intrinsic motivation would be positively associated with student engagement
3. Intrinsic motivation would mediate the relationship between needs satisfaction and student engagement.

### **Method**

#### **Participants**

120 undergraduate students aged between 18-22 years with 68 females ( $M$  age = 19.26,  $SD$  = 1.07) and 52 males ( $M$  age = 19.54,  $SD$  = 1.36) participated in the study and filled three questionnaires. The participants came from two major colleges in India and were studying undergraduate courses in commerce, arts, and science. The participants belonged to middle or higher socioeconomic status backgrounds. Only participants who had a minimum of 75% attendance participated in the research study. Convenient sampling technique was employed for the study.

#### **Measures**

##### **Needs satisfaction**

The basic psychological needs satisfaction-general scale (BPNS) assessed general needs satisfaction of the undergraduate students. The BPNS is a 21-item questionnaire, where nine items are reverse-scored. The three main dimensions of needs satisfaction- autonomy, competence and relatedness are assessed by seven items each, scored on a scale of 1 (not at all true) to 7 (very true). Sample items for autonomy "I feel like I am free to decide for myself how to live my life", competence "People I know tell me I am good at what I do", and relatedness "I really like the people I interact with." The questionnaire has shown good overall psychometric properties with Cronbach's

alpha internal consistency between .84 and .90 (Johnston & Finney, 2010). The Cronbach's alpha was .72 for the sample in the present study.

**Intrinsic motivation.** Intrinsic motivation was measured by the academic motivation scale-college version (AMS) questionnaire. AMS provides scores on dimensions of intrinsic motivation, extrinsic motivation, and amotivation. The scores on the dimension of intrinsic motivation were employed based on 12 items of the 28 item questionnaire (e.g. because I experience pleasure and satisfaction while learning new things). Intrinsic motivation was measured on a scale of 1 (does not correspond at all) to 7 (corresponds completely). The AMS has adequate psychometric properties (Vallerand et al., 1992);  $\alpha$  = .87 in the present study.

**Student Engagement.** The university student engagement inventory (USE-I) is a 15 item questionnaire to measure student engagement, where one item is reverse-scored. It assesses overall level of student engagement (e.g., I pay attention in class; I talk to people outside the college on matters that I learned in class; I like being at college) based on behavioural, cognitive, and emotional aspects on a five-point Likert scale of 1 (never) to 5 (always). The USE-I has satisfactory validity and reliability (Maroco, Maroco, Campos, & Fredricks, 2016). Cronbach's  $\alpha$  = .85.

#### **Data Analyses**

Descriptive statistics and Pearson correlations were followed by mediation analyses, using SPSS Process v2.13, model 4 (Hayes, 2012). Process is a non-parametric method of measuring mediation that allows for calculation of indirect and direct effects by bootstrapping for 5,000 samples at 95% continuous interval (Hayes, 2012).

### **Results**

#### **Correlation**

A total of 120 undergraduate students participated in the study. The results indicated that all three variables were significantly positively correlated. Basic needs satisfaction was significantly correlated with intrinsic motivation ( $r$  = .25,  $p$  < .01), and student

engagement ( $r = .32, p < .01$ ). Intrinsic motivation was significantly correlated with student engagement ( $r = .53, p < .01$ ).

### **Mediation Analysis**

The results of mediation analyses are presented Figure 1. Basic needs satisfaction was the independent variable, intrinsic motivation the mediating variable, and student engagement the dependent variable. Basic needs satisfaction had a significant effect on intrinsic motivation ( $a = .37, 95\% \text{ CI } [.08, .68], t = 2.60, p < .01$ ). Intrinsic motivation had a significant effect on student engagement ( $b = .29, 95\% \text{ CI } [.20, .38], t = 6.33, p < .01$ ). The total effect of basic need satisfaction on student engagement was found to be significant ( $r = .30, 95\% \text{ CI } [.14, .46], t = 3.67, p < .01$ ). The effect of basic needs satisfaction on student engagement, while controlling for intrinsic motivation, i.e. direct effect, was significantly lower than the total effect ( $ab = .19, 95\% \text{ CI } [.04, .34], t = 2.64, p < .01$ ) indicating the influence of the indirect effect of intrinsic motivation. The indirect effect of intrinsic motivation on needs satisfaction and student engagement was found to be significant ( $r = .11, 95\% \text{ CI } [.02, 0.22], p < .01$ ) and accounted for the difference between the total and the direct effects. Mediation effect of intrinsic motivation was found, supporting all the hypotheses.

### **Discussion**

The aim of this study was to determine whether intrinsic motivation mediated the relationship between basic needs satisfaction and student engagement for undergraduate students. Based on studies on the self-determination theory (SDT) and studies conducted by Podlog et al (2015) and Malu & Reddy (2016), intrinsic motivation was theorized to be a mediator between basic needs satisfaction and student engagement.

Results lent support to the first hypothesis- needs satisfaction would be positively associated with intrinsic motivation (Gagné, Ryan, & Bargmann, 2003; Vansteenkiste, et al., 2007). The result was supported by the SDT and other studies conducted in the domain of academic achievement and student engagement (Gunnell, Crocker, Wilson, Mack, & Zumbo, 2013). It is essential to know the antecedents of intrinsic motivation as it fosters further interest in that

particular activity and additionally, creates a platform for progress. Moreover, intrinsic motivation is also known to create higher levels of commitment, desire and performance (Schneider & Kwan, 2013) which are positive precursors to higher performance. For the study, basic needs satisfaction was measured in reference to the daily life of the undergraduate students, while intrinsic motivation was measured in reference to their academic motivation. A significant positive relationship between the two variables indicated that the satisfaction of basic needs of a student could aid in helping them become more intrinsically motivated to pursue higher education. This further indicates that a general satisfaction of needs is an important factor to feel intrinsically motivated in terms of one's academics.

However, academic needs satisfaction levels of an individual's may have a different impact on intrinsic motivation and this constitutes a major limitation of this study. Further, the study did not take into consideration the impact of other forms of motivation and their impact on student engagement which may have had a significant impact on the results of the study. Extrinsic motivation is not considered as influential as intrinsic motivation, however, it does have an influence on performance as seen in several studies (Ayub, 2010; Deci & Ryan, 2000a; Niemiec & Ryan, 2009;) and therefore, a more comprehensive understanding of the role of the different types of motivation would be valuable.

The second hypothesis- needs satisfaction would be positively related to student engagement was supported. This finding was supported by several studies conducted in the domain of academic performance and student engagement (Jang, Kim, & Reeve, 2016). The three needs of autonomy, competence, and relatedness have been shown to affect students' athletic engagement (Podlog et al., 2015; Ryan & Deci, 2007). Relatedness and competence were seen to help increase student engagement when the teachers were perceived to be caring and competent (Hughes, Luo, Kwok, & Loyd, 2008; Wood, 2016). Teachers providing autonomy support promotes students who are more engaged in classroom activity (Jang, Kim, & Reeve, 2016). The support of the assertion that needs satisfaction is positively associated

with engagement provides grounds to further investigate which of the three psychological needs are essential to influence student engagement of the undergraduate student and to look at ways to stimulate these needs separately. The result also indicated the importance of the satisfaction of basic psychological needs in daily life to stimulate higher levels of engagement. According to SDT, autonomy is the most important basic need for the development of intrinsic motivation. Need for competence by itself is not a necessary condition to develop intrinsic motivation. Therefore, it is important that further research is carried out to assess the individual effects of the separate needs on student engagement and intrinsic motivation.

The third hypothesis was supported as intrinsic motivation was positively associated with student engagement. Autonomous forms of motivation have been considered to be related to academic achievement (Kusurkar, Ten Cate, Vos, Westers, & Croiset, 2013). Intrinsic motivation has been positively linked with the area of education. A qualitative study conducted by Saeed and Zyngier (2012), showed that intrinsic motivation is related to higher levels of student engagement compared to any other forms of motivation. An understanding of the role of intrinsic motivation with reference to student engagement can benefit teachers, colleges as well as parents. With this information they can create stimulating environments for their students to learn effectively and efficiently by tapping into their personal motives towards learning. This relationship is in line with the constructs developed by the SDT with importance given to intrinsic motivation (Deci & Ryan, 2000b).

The results extended support to the hypothesis that intrinsic motivation mediated the relationship between needs satisfaction and student engagement. The findings suggest that undergraduate students who feel satisfied with their needs of autonomy, competence and relatedness can develop higher level of intrinsic motivation which further, partially, helps in the development of their engagement (Furrer & Skinner, 2003; Edmunds, Ntoumanis, & Duda, 2006). This result provides a useful link in the study of student engagement and its precursors. Significant value is placed on intrinsic motivation as it can be considered to be important for the formation of higher student engagement,

whilst also confirming that it is a mediating variable between needs satisfaction and student engagement (Niemi & Ryan, 2009). The results of this study indicate that teachers and caregivers should help fulfill the students' needs satisfaction by creating environments that are autonomy supportive, mastery orientated and stimulate positive relationships (Reeve & Lee, 2014). These changes would stimulate autonomous motivation and can lead to more engaged college students who have better attendance, grades and relationships.

### Conclusion

The study provided an understanding of the various antecedents of academic engagement for undergraduate students. It emphasized the importance of fostering intrinsic motivation among the students to create a more engaging environment for them to learn in. Perhaps, the most crucial aspect of the study is an understanding that needs satisfaction has an effect on student engagement by having an influence on student intrinsic motivation. An effort to increase intrinsic motivation directly may not be as helpful as satisfying the needs of autonomy, competence and relatedness which clearly have an influence on intrinsic motivation. The support of the model can also help explain the antecedents behind high attendance levels (engagement) of undergraduate students.

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