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Exploring the relationship between Academic Motivation and Achievement: A study of University Students in North-East India

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Abstract

The relationship between academic motivation and academic achievement among university students in North-East India are investigated in this study. This study examines the factors that influence academic motivation, namely intrinsic motivation (Knowledge, Accomplishment, and Stimulation) extrinsic motivation (Introjected regulation, External regulation, and Identified regulation) and "Amotivation" using Vallerand et al. (1992) Academic Motivation Scale as a guide. 462 university students representing a range of academic fields were surveyed to collect the necessary data for the study. Grade point averages, or GPAs, are used to quantify academic success and used as a parameter to judge academic achievement. Descriptive analysis indicated that primary source of motivation for female university students are intrinsic whereas for male it was external. However, there were no significant differences in their motivation and achievements. GPA's showed positive correlation with all the constructs of academic motivation. The only factor that could significantly predict GPAs were "Amotivation" and intrinsic motivation for accomplishment according to multiple regression analysis.

Keywords: *Academic Motivation, Academic Achievement, Academic Motivation Scale, "Amotivation", Intrinsic motivation, extrinsic motivation, North-East India.*

1. Introduction

Academic achievement by a student is influenced by many different factors, one amongst them is academic motivation. A student's performance and success in higher education can be strongly impacted by their motivation to participate in academic tasks and pursue educational goals. Hence, to improve educational outcomes and a student's well-being, one must comprehend the

relationship between academic motivation and achievement.

Studying the relationship between academic achievement and motivation is especially important in the context of North-East India, where there are many kinds of schools/ colleges and whose policies and educational system may not be always coherent. Rich cultural diversity, distinct socio-economic situations, and developing educational systems define this region. Examining the ways in which various types of academic motivation affect a student's academic performance in this setting can yield important insights into successful teaching strategies and interventions that are customized to the needs of local students.

This study examines the internal and external motivating factors that influence academic motivation in university students in North-East India, based on the Academic Motivation Scale developed by **Vallerand et al. (1992)**. To shed light on the complex relationship between motivation and performance in higher education settings, this research will examine the degree to which a student's intrinsic drive for learning and external influences impact their academic achievement.

To inform evidence-based strategies for promoting student engagement, motivation, and success in North-East India's higher education institutions, this study aims to identify patterns, trends, and correlations through a thorough analysis of academic achievement and motivation by collecting data from 462 university students to offer valuable insights to educators and decision-makers to improve educational outcomes in the area.

2. Review of Literature and Development of Concept

Motivation can be broadly defined as the driving force or energizing factor behind actions (Cabot, 2016; Ryan & Devi, 2002). It can also be regarded as a mechanism that guides, initiates, and continues goal-oriented actions (Schunk et al., 2008). Thus, it serves as a catalyst for any given action. A more focused kind of motivation is Academic Motivation. It can be defined as a stimulus for learning behavior (Zimmerman, 1989). It is can also be seen as a person's decision to pursue higher education (Clark & Schroth, 2010) or cause for academic pursuits (Vallerand and Bissonetter, 1992). Thus, Academic Motivation can be understood as a unique motivational style specific to educational field.

Focusing on primary and secondary education context, many studies have established the

relationship between academic motivation and educational performance (Komarraju, Karau & Schmeck, 2009). However, researcher could not locate any specific studies targeting students from North-East part of India. Thus, outcomes of this study add to existing literature and provides a new perspective by examining the relationship between academic motivation and academic achievement in the context of North-Eastern graduates / post-graduate students studying in various Universities.

2.1 Academic Motivation

From the basic definition of Academic Motivation, it is assumed that motivation is a causal agent in pursuing academic endeavors. Deci & Ryan's (1985). Self-determination Theory (SDT) is one of the most popular concepts that support the importance of motivation in educational endeavors. According to SDT, a person is stimulated to act by a variety of distinct motives that are linked to a wide range of goals. SDT classifies these motives into three primary categories, extrinsic motivation, that refers to doing something because it results in a different outcome, such as undergoing a computer course to improve employment prospects. On the other hand, intrinsic motivation is the desire to pursue an activity because it is fulfilling and intriguing, such as the desire to learn computers as it is interesting and fulfilling. The third category is "Amotivation", that indicates a lack of interest or intention to act (Deci & Ryan, 1985, 2002; Deci et al., 1991).

People are naturally curious, gregarious, and eager to learn new things even in the absence of outside stimulation and hence, intrinsic motivation as an innate tendency promotes cognitive, social, and physical development (Ryan and Deci, 2000a). Three types of intrinsic motivation are identified: intrinsic motivation to know, intrinsic motivation towards accomplishment and intrinsic motivation to experience stimulation (Vallerand et al., 1992). Intrinsic motivation to know relates to the joy and satisfaction feelings when one learns, explores, or attempts to understand something new. Whereas intrinsic motivation towards accomplishment relates to attempts to succeed, advance or to create something new. Lastly, intrinsic motivation to experience stimulation relates to engaging in an endeavor to feel joy, thrill, and positive emotions (Vallerand et al., 1992).

Many a time, individuals undertake activities that may not be motivated by their own desires. And it is the external environment like social pressure and the role they play influencing them to pursue activities. External motivation can also be classified into three different categories: "External" regulation, "Introjected" regulation, and "Identified" regulation (Vallerand et al.

1992). External regulation refers to actions in a way to obtain rewards or avoid punishments, introjected regulation refers to actions that has internalized goals, and identified regulation refers to acting in a way that is valued and seen as self-determined (Vallerand et al., 1992).

To fully appreciate human behavior, however, "Amotivation" is identified as the third type of motivation (Deci & Ryan, 1985). A person is neither in state of intrinsic nor extrinsic motivation in case he is unable to distinguish between actions and results (Vallerand et al., 1997). Motivated actions are symbolic for incompetence and a lack of self-determination, as individuals have no purpose and no associated rewards, which ultimately leads the activity to end (Vallerand and Bissonnette, 1992).

2.2 Academic Motivation & Academic Performance

Academic motivation has been linked to academic performance in higher education in a number of studies (Robbins et al., 2004; Öz, 2016; Önder et al., 2014; Amrai et al., 2011). However, the studies have revealed conflicting results about the motivation variables and their relationship and influence on academic achievements. Prospero and Vohra-Gupta (2017) revealed in a study with 277 participants in United States that only extrinsic motivation affected the GPA. However, Komarraju et al. (2009) in a study with 308 undergraduate students in United States, revealed that intrinsic motivation was a significant predictor of GPA. Arogul (2009) in a study with 230 preservice English language teachers in Turkey, found a negative correlation between "Amotivation" and academic performance and positive relation between GPA and intrinsic motivation. Önder et al. (2014) with 1343 Turkish undergraduate students, revealed a negative correlation between "Amotivation" and GPA and positive correlation between intrinsic and extrinsic motivation. Results of some studies showed no correlation between motivation variables and academic performance (GPA) (Almalki, 2019; Taskesen, 2019; Baker, 2003)

Studies involving motivational constructs and academic performance also revealed conflicting results. For instance, Cokley (2003) revealed a positive correlation between GPA and intrinsic motivation towards accomplishment and external regulation, where it was negatively correlated to "Amotivation". Similarly, Eymur and Geban (2011) revealed a positive correlation between academic achievement and intrinsic motivation to know, extrinsic motivation to experience stimulation. Öz (2016) found GPA is predicted by all intrinsic and extrinsic motivational constructs. Similarly, Kırkağaç and Öz (2017) found a positive correlation between academic achievement and all intrinsic and extrinsic motivational constructs except intrinsic motivation to

experience stimulation.

2.3 Academic Motivation and Gender

Regarding gender variations in student's academic motivation profiles, the literature on academic motivation paints an unclear picture.

Vallerand and Bissonnette (1992) found that while male undergraduate students performed better on the external regulation and "Amotivation" dimensions, female participants in their study scored higher on intrinsic motivation. İnan & Kartal (2018) conducted a study with 193 students at a physical education and Sports College of a state university in Turkey found no gender differences with respect to academic motivation. Finally, Taskesen (2019) found that there are female participants scored higher in intrinsic motivation showing gender differences in motivation. Erten (2014) showed male preservice teacher trainees reported a higher level of "Amotivation" in contrast to female counterparts. Köseoğlu (2013) showed significant gender differences in motivation variables. Carbonneau et al. (2012) revealed higher intrinsic motivation towards accomplishment in male undergraduate students.

Considering the inconsistent findings from the earlier research described and lack of study on the concerned population, it would seem worthwhile to investigate the academic motivation of university students in North-East India and how those motivational variables related to their GPA's scores.

To achieve this, the following research inquiries were proposed.

i) What is the role played by motivation towards academic performance amongst university students?
ii) Do male and female university students differ in terms of their level of academic achievement as measured by their GPA scores?
iii) Do male and female students differ in terms of their academic motivation levels?
iv) What is the relationship between academic motivation and academic achievement for university students?
v) Can academic achievement be predicted by any dimension of academic motivation?

3. Method

The following sections explain the research design, setting, participants, data collection procedures, instruments, and data analysis.

3.1 Research Design

The investigation is based on cross-sectional survey research. A questionnaire administered to a sample of the total population at a single point in time is used for data collection. The sample are students from different universities in North-East India. The study was undertaken with 462 graduate and postgraduate students enrolled in different universities under different fields of study. Since most of the universities follow a prescribed method for admission based on marks scored in previous exams, hence it can be assumed that the student groups are homogenous in nature. Among the 462 students identified as samples, 209 (45.23%) are a female student whereas 253 (54.76%) are male students.

3.2 Instruments

Demographic Information Form

Few demographic details were enquired through the demographic information form developed by the researcher. It included two questions; one asked the participants to mention their gender. And the second question enquired about the grade point average (GPA). GPA is considered as a highly reliable measure of undergraduate academic performance (Beatty et al., 2015)

Academic Motivation Scale

The Academic Motivation Scale (AMS- C 28, College version) suggested by Vallerand et al. (1992-1993) consists of 28 scale items scores on 7 – point Likert scale, with 0 representing ‘does not correspond at all’, and 7 for ‘corresponds exactly’. The items are organized into seven scales. Questions 2, 9, 16, and 23 for intrinsic motivation – to know (reliability coefficient of $\alpha = 0.902$). Questions 6, 13, 20, and 27 for intrinsic motivation – toward accomplishment (reliability coefficient of $\alpha = 0.910$). Questions 4, 11, 18, and 25 for intrinsic motivation – to experience stimulation (reliability coefficient of $\alpha = 0.912$). Questions 3, 10, 17, and 24 for extrinsic motivation – identified (reliability coefficient of $\alpha = 0.909$). Questions 7, 14, 21, and 28 for extrinsic motivation – Introjected (reliability coefficient of $\alpha = 0.937$). Questions 1, 8, 15, and 22 for extrinsic motivation – external regulation (reliability coefficient of $\alpha = 0.881$). Questions 5, 12, 19, and 26 for “Amotivation” (reliability coefficient of $\alpha = 0.920$).

Procedure for data collection and analysis

The questionnaire is distributed among the university students and an online questionnaire link is also sent to the university student groups. The hard copy of the questionnaire is given to 300 students. Out of these 268 were received back. 202 filled up questionnaires were received via the online reply. The available data was checked for missing values and entry errors. 8 complete forms in physical copies are rejected because of missing values. Thus, a total of 462 (260 offline and 202 online) were considered fit for data entry into SPSS. Normality was verified using SPSS statistics, the skewness and kurtosis were found to be in the acceptable range. Hence, the usual statistical test for normal distribution may be applied. SPSS v.29.0 is used to perform descriptive analysis, correlation coefficient analysis and multiple regression analysis.

4. Results

This study aims to identify if there are any gender disparities in academic achievements, measured in terms of GPA. The other objective of the study was to explore the gender disparities in academic motivation and academic achievement, if any. The study also explored the connections between academic motivation and academic achievement in university students and also the possibility of predicting academic achievement by academic motivation constructs. The results obtained in this context are detailed below.

4.1 Descriptive Findings

Academic Achievement

The academic achievement of the university students was found to be average (M = 6.70, SD =1.09). The GPA's of the male students (M=6.72, SD=1.09, MD=) and female student (M = 6.67, SD = 1.09, MD=) were found to be almost similar with no remarkable difference.

Academic Motivation

Descriptive statistics for motivational constructs with respect to gender are obtained as shown in Table 1.

Table 1: Descriptive statistics for motivation types with respect to gender

Dimension of motivation	Female (N = 209)		Male (N = 253)	
	M	SD	M	SD
Amotivation	2.810	1.222	2.783	1.238
Int: To Know	3.450	1.018	3.349	1.088
Int: Accomplishment	3.279	1.161	3.230	1.182
Int: Stimulation	3.423	1.180	3.399	1.185
Ext: Identified Regulation	3.422	1.076	3.466	1.051
Ext: Introjected Regulation	2.980	1.247	2.961	1.249
Ext: External Regulation	3.384	1.053	3.353	1.080

As can be observed from Table 1, intrinsic motivation for knowledge (M_{Female} = 3.45, SD_{Female} = 1.02) is the highest motivator for female students following by internal motivation to experience stimulation (M_{Female} = 3.42, SD_{Female} = 1.18). Whereas for male students, the highest motivator is external identified regulation (M_{Male} = 3.47, SD_{Male} = 1.05) followed by internal motivation to experience stimulation (M_{Male} = 3.4, SD_{Male} = 1.18).

4.2 Inferential Findings

Gender differences with respect to Academic Achievement

An independent sample t-test was conducted to find out whether male and female university students differed with respect to their academic achievement levels as measured by their GPAs. The results of the test are summarized in Table 2.

Table 2: Independent samples t-test results

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
GPA	Equal variances assumed	0.015	0.903	-0.450	460	0.326	0.653	-0.046	0.102	-0.247	0.155
	Equal variances not assumed			-0.450	443.060	0.327	0.653	-0.046	0.102	-0.247	0.155

Since Levene's t-test significance is greater than 0.05, equal variances are assumed and corresponding t-test p-value is found to be greater than 0.05. Thus, it can be concluded that there is no significant difference in the means of academic achievement measured by GPAs amongst male and female university students.

Table 3: Independent sample t-test for gender differences in Academic Motivation

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Amotivation	Equal variances assumed	0.386	0.535	0.236	460.00	0.407	0.813	0.027	0.115	-0.199	0.253
	Equal variances not assumed			0.237	445.71	0.406	0.813	0.027	0.115	-0.199	0.253
Int: To know	Equal variances assumed	2.598	0.108	1.022	460.00	0.154	0.307	0.101	0.099	-0.093	0.295

	Equal variances not assumed			1.028	452.97	0.152	0.304	0.101	0.098	-0.092	0.294
Int: Accomplishment	Equal variances assumed	0.219	0.640	0.442	460.00	0.329	0.659	0.048	0.110	-0.167	0.264
	Equal variances not assumed			0.443	446.40	0.329	0.658	0.048	0.109	-0.167	0.264
Int: Stimulation	Equal variances assumed	0.001	0.975	0.219	460.00	0.413	0.827	0.024	0.111	-0.193	0.242
	Equal variances not assumed			0.219	444.31	0.413	0.827	0.024	0.111	-0.193	0.241
Ext: Identified Regulation	Equal variances assumed	0.100	0.752	-0.445	460.00	0.328	0.657	-0.044	0.099	-0.239	0.151
	Equal variances not assumed			-0.444	439.74	0.329	0.657	-0.044	0.100	-0.240	0.151
Ext: Introjected Regulation	Equal variances assumed	0.008	0.930	0.165	460.00	0.435	0.869	0.019	0.117	-0.210	0.248
	Equal variances not assumed			0.165	443.85	0.435	0.869	0.019	0.117	-0.210	0.248
Ext. External Regulation	Equal variances assumed	0.274	0.601	0.313	460.00	0.377	0.755	0.031	0.100	-0.165	0.227
	Equal variances not assumed			0.313	447.50	0.377	0.754	0.031	0.100	-0.164	0.227

Gender Differences with respect to Academic Motivation

To determine whether Male and Female students differ in Academic Motivation constructs, an independent sample t-test was conducted between gender and constructs of academic motivation. The results obtained are shown in Table 3 above.

Since Levene's t-test significance is greater than 0.05, equal variances are assumed and corresponding t-test p-value is found to be greater than 0.05 for all the academic motivation constructs. Thus, it can be concluded that there is no significant difference in the means of academic motivation constructs amongst male and female university students.

Table 4: Relationships between Academic Achievement (GPA) and Academic Motivation

Correlations									
		Academic Achievement	Amotivation	Int: To know	Int: Accomplishment	Int: Stimulation	Ext: Identified Regulation	Ext: Introjected Regulation	Ext. External Regulation
Academic Achievement	Pearson Correlation	1	.528**	.261**	.417**	.332**	.278**	.371**	.242**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000	0.000
Amotivation	Pearson Correlation		1	.548**	.656**	.590**	.484**	.710**	.473**
	Sig. (2-tailed)			0.000	0.000	0.000	0.000	0.000	0.000
Int: To know	Pearson Correlation			1	.567**	.525**	.292**	.390**	.369**
	Sig. (2-tailed)				0.000	0.000	0.000	0.000	0.000
Int: Accomplishment	Pearson Correlation				1	.644**	.221**	.423**	.400**
	Sig. (2-tailed)					0.000	0.000	0.000	0.000
Int: Stimulation	Pearson Correlation					1	.270**	.395**	.370**
	Sig. (2-tailed)						0.000	0.000	0.000
Ext: Identified Regulation	Pearson Correlation						1	.345**	.131**
	Sig. (2-tailed)							0.000	0.005
Ext: Introjected Regulation	Pearson Correlation							1	.485**
	Sig. (2-tailed)								0.000
Ext. External Regulation	Pearson Correlation								1
	Sig. (2-tailed)								
	N	462	462	462	462	462	462	462	462
**. Correlation is significant at the 0.01 level (2-tailed).									

Relationship between academic achievement and academic motivation

To explore the relationship between academic achievement and academic motivation, Spearman's correlation coefficient was computed, and the results obtained are presented in Table 4 above.

It can be observed from Table 4, GPA as the measure of academic achievement correlated positively with all the academic motivation constructs with significance ($p<0.05$).

Influence of motivational constructs on academic achievement

After obtaining statistically significant relationships between academic achievement (GPA) and academic motivation constructs, a regression analysis was carried out. The objective of this is to determine the influence of each motivational construct on academic motivation.

The regression equation can be formed like:

$$Y = A_0 + A_1X_1 + A_2X_2 + A_3X_3 + A_4X_4 + A_5X_5 + A_6X_6 + A_7X_7$$

Where,

Y = Academic achievement (expressed in terms of GPA scores) (var 00001)

A = Coefficient of determinant (a constant value) (var 00002)

X_1 = "Amotivation" (var 00003)

X_2 = Internal motivation for knowledge (var 00004)

X_3 = Internal motivation to accomplishment (var 00005)

X_4 = Internal motivation to experience stimulation (var 00006)

X_5 = External motivation: Identified Regulation (var 00007)

X_6 = External motivation: Introjected regulation (var 00008)

X_7 = External motivation: External regulation (var 00009)

"ENTER' Method in SPSS was used to perform regression analysis. Variables were added to the model sequentially, and none was removed to calculate the effect of the independent variables on the dependent variable.

Table 5: Model summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543[a]	0.295	0.284	0.92375
a. Predictors: (Constant), VAR00009, VAR00007, VAR00006, VAR00004, VAR00008, VAR00005, VAR00003				

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	161.826	7	23.118	27.092	<.001[b]
	Residual	387.403	454	0.853		
	Total	549.229	461			
a. Dependent Variable: VAR00002						
b. Predictors: (Constant), VAR00009, VAR00007, VAR00006, VAR00004, VAR00008, VAR00005, VAR00003						

The R square value predicts the model to be 29.5% accurate in explaining the variance in the dependent variable. And hence, can be considered that the motivational constructs as a group can predict around 29.5% of the academic achievement variance. The ANOVA table confirms that the overall regression model is significant ($p<0.05$ at df = 7)

To assess the influence of individual constructs of academic motivation on academic achievement, the output from Table 6 is utilized.

Table 6: Coefficients

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.247	0.217		24.142	0.000
	Amotivation	0.392	0.067	0.442	5.870	0.000
	Int: To knowledge	-0.093	0.053	-0.090	-1.754	0.080
	Int: To Accomplishment	0.159	0.056	0.171	2.834	0.005
	Int: To Stimulation	-0.005	0.051	-0.005	-0.089	0.929
	Ext: Identified regulation	0.054	0.047	0.052	1.132	0.258
	Ext. Introjected regulation	0.008	0.051	0.009	0.159	0.874
	Ext: External regulation	-0.012	0.049	-0.012	-0.243	0.808
a. Dependent Variable: GPA						

From the tabled data, it is observed that only “Amotivation” and Internal motivation for accomplishment are significant ($p<0.05$). It clearly means that only “Amotivation” and Internal motivation to accomplishment can create unique variations in the academic achievement (GPA). The regression equation can be formed as

$$Y=5.247+ 0.392X_1+(-0.093)X_2+ 0.159X_3+(-0.005)X_4+0.054X_5+0.008X_6+(-0.012)X_7$$

5. Conclusion

There are a substantial number of studies linking student motivation to academic motivation, however there is none demonstrating the effect for the university students in North – East India. To address this gap in the literature, this study was conducted to explore the relationship between

academic motivation and academic achievements in university students. The study's insights add to the existing literature on the influence of motivation on academic achievement for students in higher education.

The results revealed that there is no significant difference in academic achievement from the gender perspective. However, female students gave more importance to intrinsic motivation for knowledge whereas male student gave more importance to external motivation identified regulation. Thus, can be concluded that female student is keener to gain knowledge, whereas male students are looking for value.

The results of the study also revealed that all the motivational constructs, namely, extrinsic motivation, intrinsic motivation and "Amotivation" play a role in a student's academic achievement. All the motivational constructs are positively correlated to academic achievement. The predicting model was significant, and as a group the motivational constructs were able to explain 29.5% of the variance in the academic achievements. As far as influence of individual constructs is concerned, only "Amotivation" and intrinsic motivation for accomplishment were able to define unique variations in academic achievement.

It is worth mentioning here that the study was conducted without demarking specializations. Students in each subject specialization may provide different results. Moreover, the study didn't separate the data between the government, universities, and private universities. The results may vary depending on the academic setting of both these types of universities. As it is observed that the motivation variables can explain only 29.5% of the variance in academic achievement, clearly indicating that there are other factors which are influencing academic achievements.

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