Original Article

Effects of Learning Motivation and Engagement on the Academic Performance and Satisfaction of Senior High School Students

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Abstract: Worldwide, educational systems are grappling with maintaining quality of education in the 21st century as a result of destructive trends like the covid-19 pandemic, fast-moving technology, and socio-economic challenges, such as increasing poverty and family destabilization. The multi-level challenges have had a profound impact on students' psychological health, and the increasing dropout rate erodes learners' motivation, engagement, academic achievement, and satisfaction. This study seeks to comprehensively understand and enhance how motivation and engagement affect academic outcomes. It explores the spectrum of student motivation—from motivation to intrinsic and identified regulation and examines how these motivational levels correlate with different types of engagement (affective, behavioral, and cognitive) and their collective impact on academic performance and satisfaction. The primary goal is to provide educators and administrators with actionable insights that can be used to improve teaching strategies and support systems, ensuring that educational offerings remain effective and responsive to student needs amidst ongoing global challenges. Focusing on a sample of 50 grade 12 students from don Carlos national high school in sinangguyan, don Carlos, bukidnon, Philippines, and this quantitative study utilizes motivation and performance scales (MPs), along with correlation and regression analyses, to assess relationships among motivation, engagement, satisfaction, and academic performance. Survey questionnaires employing 5-point scales and secondary academic data were used for data collection. Preliminary results indicate that while students are generally motivated by external and introverted regulation, intrinsic motivation and motivation are concerning. Engagement appears positive in affective dimensions but moderate in behavioral and cognitive dimensions. Satisfaction rates are highest in teaching and generic skills, but assessment satisfaction remains low. The study also finds that while certain forms of regulation bolster engagement, leading to a domino effect, motivation and engagement do not directly correlate with academic performance and satisfaction, suggesting a complex interplay that requires further exploration. This research underscores the need for educators to reassess strategies that enhance learner self-regulation and its impact on engagement and academic outcomes. Future research could refine predictive models and consider additional moderating variables to develop more targeted educational interventions that foster enduring engagement and educational success.

Keywords: learning motivation, learning engagement, self-satisfaction, self-determination theory

1. INTRODUCTION

In the 21st-century educational landscape, all schools worldwide have confronted multiple challenges in educational reforms, science, technology, and health that hinder the delivery of quality education

[1]. The recent health crisis, the covid-19 pandemic, has tremendously affected the educational system of the world and the advancement of technologies that significantly impact the psychological well-being of learners. Rising poverty in rural and urban, family disorientation, and teenage pregnancy result in a large number of dropout cases in schools. All issues and concerns affected the students' motivation and engagement, resulting in poor academic performance and self-satisfaction [2]. Thus, the researcher was motivated to study the effects of learning motivation and engagement on students' academic performance and satisfaction so that teachers and administrators could able to create solutions and develop programs and innovations that will help uplift the quality of education despite prevalent challenges. According to Han and yin, motivation specifies why people decide to do something, how long people are willing to sustain the activity, and how hard they will pursue it [3]. Alivernini and Lucida categorized motivation into five levels from lowest to highest: motivation, external regulation, introverted regulation, intrinsic regulation, and identified regulation. Motivated individuals lack the intent to act neither intrinsically nor extrinsically [4]. Externally regulated individuals perform to meet extrinsic demand; introverted regulated are those whose behaviours are controlled by internal reward or punishment contingencies such as ego, guilt, or anxiety. Intrinsic regulation is a self-determined form of behaviour as an individual performs an activity for its inherent satisfaction [5]. Identified regulation is a more autonomous, self-determined form of extrinsic motivation as they value behaviour for personal reasons [6].meanwhile, student engagement is a psychological process that mediates the effects of the contextual antecedents on student outcomes [7]. It is the student's effort, interest, enjoyment, and absorption in initiating and sustaining learning activities in school categorized student engagement into affective, behavioural, and cognitive. Affective engagement refers to intrinsic motivation to learn, behavioural engagement pertains to being diligent and active in academics and extra-curricular activities, and cognitive engagement directs the learners in deep cognitive processing [8]. In this study, academic performance is defined as the general average grade of the student in all subjects. A student's numerical rating is equivalent to his/her overall academic performance in written works and performance tasks [9]. On the other hand, learning satisfaction is a student self-assessment rating in three categories: teaching, assessment, generic skills and learning experiences .motivation is an essential component of the student's academic success [10]. Individuals with higher learning motivation achieved higher achievements and learning outcomes. Thus, identifying the different learning motivations of the students helps the teachers, administrators, and parents assess the needs of students [11]. This study examined student engagement as another variable to evaluate further if the learning motivations are conclusively accepted reasons to reject the null hypotheses [12]. The study of Archie and Balcones concluded that motivation to learn and student engagement are positively and significantly related. For instance, studies cited have shown that students with high levels of student engagement have better grades, higher self-esteem, and socially appropriate behaviours. Nevertheless, since we are dealing with student performance and satisfaction, it would also be essential to look at students' motivation and engagement levels because these two variables coincide [13]. Moreover, the study also examined whether motivation and engagement affect the students' learning satisfaction. For instance, the study of change, ivy., and change, why., examined the significance of learning motivation on learning satisfaction, which showed that motivation has a significant impact on teacher and teaching, course content, and class materials, and administrative services but partially significant in the learning environment [14]. This study will give us a conceptualization of whether a student's motivation and engagement are purely academics or due to learning satisfaction from the school [15]. In addition, this paper fatherly examined if the variables utilized have significance and relationship to one another. It utilized secondary and primary data from the grade 11 senior high school students of Don Carlos national high school, sinangguyan, Don Carlos, bukidnon, Philippines [16]. Participants were chosen through a simple random sampling method. For research instruments, the researcher utilized

the academic motivation scale (arms) developed by valerian and colleagues in 1992, the student engagement scale [17], and the student satisfaction scale by finger and peter (2012). Survey questionnaires were distributed to the participants, and the data were collected and analysed using statistical tools. The research design of the study would involve a correlational research design [18]. Furthermore, the study also investigated the effects of learning motivations and engagement on students' academic performance and satisfaction. It also evaluated if learning motivation and engagement were significantly related to academic performance and satisfaction, including the within and between relationships among variables [19]. The study also analysed the extent of the effect of the independent variables on predictors through regression analysis. The study revealed that students are "likely" motivated, driven by external pressures, and introverted self-regulation. Intrinsic motivation exists but needs nurturing. A motivation remained a big challenge in student's performance [20]. The engagement had an overall positive impact but was driven more by emotions than actions or deep thinking. Affective engagement is the most potent factor, followed by moderate behavioural and cognitive engagement. Satisfaction was highest in teaching and generic skills but fell short in assessment. Students found assessment satisfaction insignificant in motivation. On the other hand, the correlations revealed that motivation negatively affects intrinsic motivation, while introverted regulation bridges the gap toward internalized motivation. Engagement components positively correlate, suggesting a domino effect. However, motivation and engagement generally do not directly impact academic performance and satisfaction [21]. Similarly, findings required more than student satisfaction to drive good academic performance. Thus, it is necessary to reevaluate learner self-regulation and its impact on engagement and academics. Researchers may refine models on predicting student self-satisfaction from motivation and engagement and conduct further studies on the interplay between motivation, engagement, satisfaction, and academic performance, considering moderating variables [22].in conclusion, the outcomes were a valuable basis for creating school frameworks, programs, and innovations that will help uplift the quality of education. Teachers and researchers were encouraged to develop research in teaching and learning areas based on the findings and recommendations. Similarly, concerned individuals may refer to the results of this study as aiding them in addressing issues and concerns about student motivation, engagement, satisfaction, and academic performance.

2. MATERIALS AND METHODS

The study aimed to examine the effects of learning motivation and engagement on the academic performance and satisfaction of the students. Hence, the researcher utilized a quantitative research design in this study. Mean average scores were used to measure the levels associated with the variables. Correlation analysis was used to establish significant relationships. Lastly, it used regression analysis to measure the effect among variables. The study was conducted at Don Carlos national high school. Sinangguyan, Don Carlos, bukidnon, Philippines. The school comprised of junior high school and senior high school curriculum with enrollees of 1,307 for school year 2023-2024. The school was located in the municipality of Don Carlos, bukidnon, Philippines. The study's participants were 50 grade 12 students enrolled for the school year 2023-2024 with no failed subject during the previous year level. The participants answered the survey questionnaires, and their academic performance during the previous year was collected. The study employed a simple random sampling method. All grade 12 students were assigned identification numbers, and fifty students were chosen using an excel randomizer. The method is the easiest and fastest way, considering the number of students in the research locale. The participant's id numbers were determined, and the researcher then informed them of the purpose and goal of the study and their valuable contribution. Participants answered the survey questionnaires, and data on their academic performance during the previous year was gathered. For research instruments, the researcher utilized the academic motivation scale (arms)

developed by valerian and colleagues in 1992, the student engagement scale, and the student satisfaction scale by finger and peter. Survey questionnaires were distributed to the participants, and the data were collected and analyzed using statistical tools.

3. RESULTS AND DISCUSSION

Table 1 below shows the motivation levels on a motivation, external regulation, introverted regulation, identified regulation, and intrinsic regulation. Overall motivation leans towards "likely," with an average score of 3.76, which falls under the "likely" range (3.41 - 4.2) on the liker scale [23]. External and introverted regulations are highest; both scored above 3.9, indicating a strong influence on motivation from external factors (e.g., rewards, punishments) and internalized pressures (e.g., guilt, obligation). Intrinsic and identified regulations are close behind, with scores around 3.9, suggesting some influence from personal interest and value alignment, but are more vital than external and introverted factors.

Table 01: Level of learning motivation

motivation category	Mean	Descriptive equivalent
A motivation	1.81	Unlikely
External regulation	3.97	Likely
Interjected regulation	4.11	Likely
Identified regulation	3.96	Likely
Intrinsic regulation	3.96	Likely
Average	3.76	Likely

*T*able 2 below shows the levels of engagement in affective, behavioral, and cognitive. Overall engagement is positive but varies: the average score of 3.91 falls under "agree" on the liker scale, indicating a generally positive stance but not quite reaching "strongly agree." affective engagement stands out with a score of 4.24. With this dimension, capturing emotional responses shows the most robust positive response, reaching "strongly agree" with the students who are more emotionally invested in the topic. Behavioral and cognitive engagement is moderate, scoring around 3.7. These dimensions, reflecting actions and thought processes, show agreement but less strongly than affective engagement. People seem involved in actions and thinking but not as enthusiastic as emotionally. While there is a positive overall engagement, it is driven more by emotional connection than by actions or deep cognitive processing. These results suggest potential areas for improvement in terms of translating emotional investment into more active and thoughtful engagement, such as capitalizing on a solid emotional connection like designing activities that tap into students' feelings and interests, bridging the gap to action like encouraging students to translate their emotional investment into concrete behaviors (e.g., discussions, projects), and nurture deeper cognitive engagement by providing opportunities for analysis, reflection, and critical thinking to complement emotional connection.

Table 02: Level of engagement

Engagement category	Mean	Descriptive equivalent
Affective engagement	4.24	Strongly agree
Behavioral engagement	3.76	Agree
Cognitive engagement	3.72	Agree
Average	3.91	Agree

*T*able 3 below shows the satisfaction levels with teaching, assessment, generic skills, and learning experiences. Students strongly agree with the teaching aspect (4.32, strongly agree), suggesting they find it compelling and engaging. They also strongly agree with the value of generic skills and learning experiences (4.24, strongly agree), highlighting their appreciation for broader outcomes beyond just content. However, the assessment needs to improve, with an average score of 3.88 (agree), suggesting students might find assessments less helpful or motivating. Thus, it is essential to dig deeper into assessment by identifying the assessments that might be less appealing to the student perceived as fair, relevant, and informative. Teachers could also connect assessment to learning by showing students how assessments contribute to their development and mastery of skills and exploring alternative assessments incorporating student-driven or self-reflection elements to increase engagement and ownership of learning.

Table 03: Level of satisfaction

Satisfaction category	Mean	Descriptive equivalent
Teaching	4.32	Strongly agree
Assessment	3.88	Agree
Generic skills and learning experiences	4.24	Strongly agree
Average	**4.15**	**Agree**

Table 4 below shows the levels of academic performance of the students. It obtained a mean of 86.3, which is interpreted as very satisfactory. On average, students had a very satisfactory academic performance regardless of their level of motivation and engagement.

Table 04: Level of academic performance

	Mean	Descriptive equivalent
Academic performance	86.30	**Very satisfactory**

The data below were analyzed using correlation analysis to test significance and relationship. The hypotheses were evaluated using an alpha level of 0.05 with n=50. Table 5 below shows significant relationships among motivation. Thus, the null hypothesis fails to be accepted. A motivation has a strong negative significant relationship to intrinsic regulation (*r=-0.416**, p=0.003),* which means that as a motivation increases, the intrinsic regulation decreases and vice versa. It signifies that motivated students did not find pleasure and satisfaction in doing tasks because they felt they lacked purpose in school. Additionally, the interjected regulation has a strong positive significant relationship between identified regulation (r= 0.486, p=0.000) and intrinsic regulation (r=0.538, p=0.000). It means that an increase in interjected regulation increases identified and intrinsic regulation and vice versa. As defined by deco & ryan (2000), interjected regulation refers to individual behavior on internal reward or punishment contingencies such as ego, guilt, or anxiety. The student's self-esteem eventually helps them see the practical application of learning and feel pleasure and satisfaction in doing tasks. Although this is a good indication, it is less sustainable in the long run because individuals may feel burnout and other negative tendencies; however, if managed carefully, like cultivating more conscious and critical awareness, it could lead to a productive outcome.

Table 05: Significance among motivations

		A motivation	External regulation	Interjected regulation	Identified regulation	Intrinsic regulation
A motivation	Pearson correlation	1	-.169	-.202	-.026	-.416[**]
	Sig. (2-tailed)		.240	.159	.857	.003
External regulation	Pearson correlation	-.169	1	.182	-.031	.269
	Sig. (2-tailed)	.240		.205	.828	.059
Interjected regulation	Pearson correlation	-.202	.182	1	.486[**]	.538[**]
	Sig. (2-tailed)	.159	.205		.000	.000
Identified regulation	Pearson correlation	-.026	-.031	.486[**]	1	.358[*]
	Sig. (2-tailed)	.857	.828	.000		.011
Intrinsic regulation	Pearson correlation	-.416[**]	.269	.538[**]	.358[*]	1
	Sig. (2-tailed)	.003	.059	.000	.011	
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

Table 6 below shows significant relationships among student engagement. Thus, the null hypothesis fails to be accepted. A strong positive significant relationship between affective and behavioral engagement (r= 0.503, p=0.000) and behavioral and cognitive engagement (r=0.477, p= 0.000). The increase in affective engagement also increases behavioral engagement. Similarly, as behavioral engagement increases, cognitive engagement also increases. Affective engagement refers to intrinsic motivation to learn. Behavioral engagement pertains to being diligent and active in academics and extra-curricular activities. Cognitive engagement directs the learners in deep cognitive processing. The results signified that students often find pleasure and satisfaction in doing tasks related to academics and extra-curricular activities. Moreover, these behavioral tasks related to academics and curricular activities also help the students to develop their cognitive skills. Thus, it is helpful that the school and teachers establish activities that involve emotional appreciation, such as writing reflections and character-building activities.

Table 06: Significance among student engagements

		Affective engagement	Behavioral engagement	Cognitive engagement
Affective engagement	Pearson correlation	1	.503[**]	.231
	Sig. (2-tailed)		.000	.106
Behavioral engagement	Pearson correlation	.503[**]	1	.477[**]
	Sig. (2-tailed)	.000		.000

Cognitive engagement	Pearson correlation	.231	.477**	1
	Sig. (2-tailed)	.106	.000	
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 7 below shows significant relationships between motivation and student engagement. Thus, the null hypothesis fails to be accepted. A strong positive significant relationship between interjected regulation and behavioral engagement *(r= 0.472, p=0.001)* and intrinsic regulation and behavioral engagement *(r=0.606, p=0.000)*. The results mean that as interjected regulation increases, behavioral engagement also increases. It suggests that as student internal reward or punishment contingencies such as ego, guilt, or anxiety increase, their behavioral engagement in academics and extra-curricular activities also increases. However, the interjected regulation may lead to students' burnout and ultimately degrade their behavioral engagement. Thus, it is vital to consider the student's well-being in providing lifelong learning. On the other hand, a strong positive relationship exists between intrinsic regulation and behavioral engagement *(r= 0.606, p=0.000)*, which means that as intrinsic motivation increases, behavioral engagement also increases. It further signifies that, being intrinsically motivated, students often find pleasure, satisfaction, and interest in doing academic and extra-curricular activities.

Table 07: Significance between motivation and student engagement

		Affective engagement	Behavioral engagement	Cognitive engagement
A motivation	Pearson correlation	-.149	-.172	-.198
	Sig. (2-tailed)	.301	.233	.168
External regulation	Pearson correlation	.196	.173	.009
	Sig. (2-tailed)	.172	.229	.950
Interjected regulation	Pearson correlation	.210	.472**	.240
	Sig. (2-tailed)	.143	.001	.093
Identified regulation	Pearson correlation	.119	.134	-.102
	Sig. (2-tailed)	.410	.352	.482
Intrinsic regulation	Pearson correlation	.165	.606**	.184
	Sig. (2-tailed)	.253	.000	.202
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 8 below showed no significant relationships between a motivation, external regulation, interjected regulation, identified regulation, or intrinsic regulation toward academic performance, with p-values > 0.05. Thus, our null hypothesis was *accepted*. Hence, the motivation is not a significant factor that could affect academic performance. It suggested that learning motivation is directly related to learning achievements. However, the results call for urgent attention in teaching and learning as this suggests that motivation is insufficient in driving student's academic performance.

Table 08: Significance between motivations and academic performance

		Academic performance
A motivation	Pearson correlation	-.160
	Sig. (2-tailed)	.267
External regulation	Pearson correlation	.115

	Sig. (2-tailed)	.427
Interjected regulation	Pearson correlation	-.013
	Sig. (2-tailed)	.926
Identified regulation	Pearson correlation	-.055
	Sig. (2-tailed)	.706
Intrinsic regulation	Pearson correlation	.161
	Sig. (2-tailed)	.264
**. Correlation is significant at the 0.01 level (2-tailed).		
*. Correlation is significant at the 0.05 level (2-tailed).		

Table 9 below shows significant relationships between motivation and satisfaction. Thus, the null hypothesis fails to be accepted. A weak negative significant relationship between a motivation and teaching (r = -0.297, p = 0.036). As the students' a motivation increases, self-satisfaction toward teaching slightly decreases. It signifies that motivated students were unlikely to be satisfied with the teacher's teaching performance. Additionally, there is a weak positive significant relationship between external regulation and teaching (r = 0.296, p = 0.037) and interjected regulation and teaching (r = 0.336, p = 0.017). As external and interjected regulation of the student increases, their self-satisfaction toward teaching will also slightly increase. The results suggest that external and interjected motivation are factors for student satisfaction regarding teacher's teaching performance. Furthermore, a strong positive relationship exists between intrinsic regulation and teaching (r = 0.495, p = 0.000), intrinsic regulation and generic skills and learning experiences (r = 0.424, p = 0.002), which means the intrinsically motivated individual strongly agrees on their self-satisfaction toward teaching, skills, and experience. These individuals find interest in doing tasks that are inherent to them, such as joy, satisfaction, pleasure, and experiences.

Table 09: Significance between motivations and student satisfaction

		Teaching	Assessment	Generic skills and learning experiences
A motivation	Pearson correlation	-.297[*]	-.062	-.040
	Sig. (2-tailed)	.036	.669	.784
External regulation	Pearson correlation	.296[*]	.261	-.021
	Sig. (2-tailed)	.037	.068	.883
Interjected regulation	Pearson correlation	.336[*]	.183	.424[**]
	Sig. (2-tailed)	.017	.202	.002
Identified regulation	Pearson correlation	.239	-.134	.100
	Sig. (2-tailed)	.095	.355	.489
Intrinsic regulation	Pearson correlation	.495[**]	-.001	.089
	Sig. (2-tailed)	.000	.995	.541
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 10 below showed no significant relationships between student engagement and academic performance, with p-values > 0.05. Thus, our null hypothesis was *accepted*. Hence, student engagement is not a significant factor that could affect academic performance. Suggested that learning motivation is directly related to learning achievements. However, the results call for urgent attention in teaching and learning as this suggests that student engagement is insufficient in driving student's academic performance.

Table 10: Significance relationship student engagement and student academic performance

		Academic performance
Affective engagement	Pearson correlation	.148
	Sig. (2-tailed)	.305
	N	50
Behavioural engagement	Pearson correlation	.125
	Sig. (2-tailed)	.388
	N	50
Cognitive engagement	Pearson correlation	-.007
	Sig. (2-tailed)	.959
	N	50

Table 11 below shows significant relationships between student engagement and satisfaction. Thus, the null hypothesis fails to be accepted. Below showed a significant strong positive relationship between behavioral engagement and generic skills and learning experiences (r=0.376, p=0.007), which means that as behavioral engagement increases, the skills and learning experiences also increase, indicating that students who are active in academic and extracurricular have the strong satisfaction in terms of their skills and learning experiences. Similarly, there is also a strong positive significant relationship between cognitive engagement and assessment (r=0.401, p=0.004), which suggests that cognitive engagement may result in strong positive assessment satisfaction. Furthermore, a weak positive significant relationship between cognitive engagement and generic skills and learning experiences (r=0.318, p=0.025) means that cognitive engagement has significance in the students' satisfaction with skills and experiences.

Table 11: Significance relationship student engagement and student satisfaction

Student engagement		Teaching	Assessment	Generic skills and learning experiences
Affective engagement	Pearson correlation	.212	.075	.163
	Sig. (2-tailed)	.139	.605	.258
	N	50	50	50
Behavioral engagement	Pearson correlation	.261	.277	.376[**]
	Sig. (2-tailed)	.067	.052	.007
	N	50	50	50
Cognitive engagement	Pearson correlation	.220	.401[**]	.318[*]
	Sig. (2-tailed)	.125	.004	.025
	N	50	50	50
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 12 below showed no significant relationship between student satisfaction and academic performance (p-values > 0.05). Thus, our null hypothesis was *accepted*. This result suggests that student satisfaction is not a factor in academic performance. This further validates that student satisfaction cannot define academic performance. Based on the results, it could not provide sufficient proof of whether the teaching, the assessment, and the generic skills and learning experiences guarantee positive or negative academic achievement. However, the results call for urgent attention in teaching and learning as this suggests that student self-satisfaction is insufficient in driving student's academic performance.

Table 12: Significant relationships between satisfaction and academic performance

		Academic performance
Teaching satisfaction	Pearson correlation	.046
	Sig. (2-tailed)	.749
Assessment satisfaction	Pearson correlation	.077
	Sig. (2-tailed)	.597
Generic skills and learning experiences satisfaction	Pearson correlation	-.154
	Sig. (2-tailed)	.286
**. Correlation is significant at the 0.01 level (2-tailed).		

Table 13 below shows a strong positive significant relationship between assessment and generic skills and learning experiences (r= 0.544, p=0.000). Thus, our null hypothesis is *rejected*. As assessment satisfaction increases, the satisfaction of generic skills and learning experiences strongly increases and vice versa. The result suggests that the assessment is a vital factor contributing to students' skills and learning experience satisfaction.

Table 13: Significance relationship among student satisfactions

		Teaching	Assessment	Generic skills and learning experiences
Teaching	Pearson correlation	1	.120	.089
	Sig. (2-tailed)		.408	.539
Assessment	Pearson correlation	.120	1	.544**
	Sig. (2-tailed)	.408		.000
Generic skills and learning experiences	Pearson correlation	.089	.544**	1
	Sig. (2-tailed)	.539	.000	
**. Correlation is significant at the 0.01 level (2-tailed).				

A simple linear regression was calculated to predict academic performance based on learning motivation and learning engagement. Table 14 shows that the models r-squared is 0.113, meaning it explains only 11.3% of the variance in the data. It is over fitting, as evidenced by the negative adjusted r-squared (-0.06) and average prediction error of 3.81 units. These results further explained that the model has low explanatory power and does not generalize the overall data.

Table 14: Model summary on academic performance

Model	R	R square	Adjusted r square	Std. Error of the estimate
1	.337ᵃ	.113	-.060	3.811
A. Predictors: (constant), cognitive engagement, external regulation, identified regulation, a motivation, affective engagement, intrinsic regulation, introjected_regulation, behavioral engagement				

Table 15 below showed no significant equation found. The f-statistic is 0.655, which is not large enough to reject the null hypothesis, and the p-value is 0.727, which is much larger than 0.05. It means that we cannot reject the null hypothesis, and we cannot conclude that the model is statistically significant.

Table 15: Anovaᵃ on academic performance

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	76.120	8	9.515	.655	.727ᵇ
	Residual	595.380	41	14.521		
	Total	671.500	49			
A. Dependent variable: academic performance						
B. Predictors: (constant), cognitive engagement, external regulation, identified regulation, a motivation, affective engagement, intrinsic regulation, introjected_regulation, behavioral engagement						

Table 16 below shows the relationship between various learner self-regulation factors and engagement components. Significant predictors are a motivation and intrinsic regulation. A motivation has a negative coefficient (-.912), which suggests that students with higher a motivation (low motivation and effort) tend to have lower affective engagement (enjoyment and interest). Intrinsic regulation has a positive coefficient (1.115), indicating that students with higher intrinsic regulation (motivation from internal rewards) tend to have higher cognitive engagement (effort and focus). Other possible predictors (need further investigation) are external and identified regulations. External regulation has a positive coefficient (0.192), suggesting external pressure might weakly increase affective engagement, but the significance level (0.752) is high, meaning this effect could be random. Identified regulation has a negative coefficient (-0.792), implying that identified regulation (motivation from valuing the activity) might be associated with lower affective engagement. However, the significance level (0.492) is high, requiring further analysis. Non-significant predictors are interjected regulation, behavioral engagement, and cognitive engagement. Their coefficients and significance levels suggest they have an unclear relationship with the other variables. Moreover, learner a motivation and intrinsic regulation are the most consistent predictors of affective and cognitive engagement, respectively. Other factors need further investigation or may have weaker/indirect effects.

Table 16: Coefficients on academic performance

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(constant)	86.576	6.761		12.805	.000
	A motivation	-.912	.853	-.184	-1.069	.291
	External regulation	.192	.604	.051	.318	.752
	Introjected_regulation	-.349	1.143	-.061	-.306	.761
	Identified regulation	-.792	1.142	-.129	-.693	.492
	Intrinsic regulation	1.115	1.192	.227	.935	.355
	Affective engagement	.726	1.087	.123	.668	.508
	Behavioral engagement	-.453	1.223	-.094	-.370	.713
	Cognitive engagement	-.163	.868	-.033	-.187	.852
A. Dependent variable: academic performance						

A simple linear regression was calculated to predict student self-satisfaction based on learning motivation and engagement. Table 16 below shows that the model's r-squared value is 0.207, which indicates that the model explains 20.7% of the variance in the data. The adjusted r-squared value of 0.052 is lower than the r-squared value, which suggests that the model may be over fitting the data. The standard error of the estimate is 0.66873, which means that the average prediction is off by 0.66873 units from the actual value. The model has a weak relationship with the data. The low r-squared and adjusted r-squared values suggest that the model does not explain much of the variance in the data. Additionally, the high standard error of the estimate suggests that the model needs to be more accurate in predicting the dependent variable.

Table 16: Model summary for student satisfaction

Model	R	R square	Adjusted r square	Std. Error of the estimate
1	.455[a]	.207	.052	.66873
A. Predictors: (constant), cognitive engagement, external regulation, identified regulation, a motivation, affective engagement, intrinsic regulation, introjected_regulation, behavioral engagement				

Table 17 below showed no significant equation found. The f-statistic is 1.337, which is not large enough to reject the null hypothesis, and the p-value is 0.253, which is much larger than 0.05. It means that we cannot reject the null hypothesis, and we cannot conclude that the model has explained a statistically significant amount of the variance in the data.

Table 17 Anova[a] on student satisfaction

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	4.785	8	.598	1.337	.253[b]
	Residual	18.335	41	.447		
	Total	23.120	49			
A. Dependent variable: satisfaction						
B. Predictors: (constant), cognitive engagement, external regulation, identified regulation, a						

motivation, affective engagement, intrinsic regulation, introjected_regulation, behavioral engagement

Table 18 below shows that the constant term, (constant), has a statistically significant positive relationship with the outcome variable (p-value = 0.000), implying that even when all other variables are zero, there is still a positive effect on the outcome variable. A motivation, external regulation, and interjected regulation have statistically non-significant relationships with the outcome variable (p-values > 0.05), meaning that we cannot conclude whether there is a positive or negative relationship between these variables and the outcome variable. Identified and intrinsic regulation have statistically significant positive relationships with the outcome variable (p-values < 0.05), suggesting that higher levels of these variables are associated with higher levels of the outcome variable. Affective and behavioral engagement have statistically non-significant relationships with the outcome variable (p-values > 0.05), signifying that we cannot conclude whether there is a positive or negative relationship between these variables and the outcome variable. Cognitive engagement has a statistically significant negative relationship with the outcome variable (p-value = 0.186), which means that higher levels of cognitive engagement are associated with lower levels of the outcome variable. Furthermore, the model suggests that identified and intrinsic regulation are the most important predictors of the outcome variable. However, more research is needed to determine the causal relationships between these variables and the outcome variable.

Table 18: Coefficients on student satisfaction

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(constant)	4.893	1.186		4.124	.000
	A motivation	-.046	.150	-.050	-.308	.759
	External regulation	-.176	.106	-.251	-1.662	.104
	Interjected regulation	.096	.201	.091	.481	.633
	Identified regulation	.218	.200	.191	1.086	.284
	Intrinsic regulation	-.331	.209	-.362	-1.581	.121
	Affective engagement	.086	.191	.078	.451	.655
	Behavioral engagement	.154	.215	.172	.716	.478
	Cognitive engagement	-.205	.152	-.226	-1.347	.186
A. Dependent variable: satisfaction						

Discussion

The motivation levels on a motivation, external regulation, introverted regulation, identified regulation, and intrinsic regulation. Overall motivation leans towards "likely," with an average score of 3.76, which falls under the "likely" range (3.41 - 4.2) on the liker scale [23]. External and introverted regulations are highest; both scored above 3.9, indicating a strong influence on motivation from external factors (e.g., rewards, punishments) and internalized pressures (e.g., guilt, obligation). Intrinsic and identified regulations are close behind, with scores around 3.9, suggesting some influence from personal interest and value alignment, but are more vital than external and introverted factors [24]. A motivation stands out with a score of 1.81; a motivation (lack of motivation) is the lowest and falls under "unlikely. "Moreover, while external and interjected

pressures play a significant role, there is also a notable influence from intrinsic and identified motivations, suggesting a somewhat complex motivational landscape [25]. A motivation is at odds with the other factors, indicating a potential area for further exploration. However, it would be essential to investigate the "a motivation zone" by identifying what tasks or activities lack motivation and the underlying reasons (e.g., difficulty, lack of relevance). Additionally, we could nurture the identified and intrinsic regulations by building on what students already value and find interesting, like connecting learning to their personal goals and aspirations and reducing the reliance on external pressures by gradually shifting from rewards and punishments to fostering autonomy and mastery experiences [26].

4. CONCLUSION

This study explores the intricate relationships among motivation, engagement, satisfaction, and student academic performance. The findings suggest that motivation is generally positive, with notable influences from external and interjected pressures. While intrinsic motivation holds potential, it requires further cultivation. A motivation presents challenges, as it reflects a lack of purpose and enjoyment in tasks, which could be addressed by investigating specific unmotivated behaviors, understanding their root causes, and fostering intrinsic and identified motivations through activities that build on students' interests, tie learning to personal goals, and minimize external pressures. Engagement appears to positively influence outcomes but is predominantly emotional rather than action-oriented or deeply cognitive. Affective engagement is identified as the most significant predictor, indicating strong emotional investment by students. Behavioral and cognitive engagement levels are moderate and suggest areas for enhancement. Teachers can enhance engagement by creating emotionally resonant activities that encourage participation and deepen intellectual engagement through opportunities for discussion, project work, analysis, and reflection. In terms of satisfaction, students express high satisfaction with teaching and generic skills, yet show discontent with assessment practices, finding them unhelpful or demotivating. Addressing these concerns involves examining specific issues related to fairness, relevance, and in formativeness of assessments, aligning them more closely with learning objectives, and considering alternative formats like student-led reflections. The study also reveals a strong negative correlation between a motivation and intrinsic motivation, suggesting these are opposing forces. A positive link between interjected regulation and identified and intrinsic motivations indicates that interjected regulation might serve as a transitional phase toward more internalized forms of motivation. Furthermore, there is a positive interrelation among affective, behavioral, and cognitive engagement, suggesting that emotional investment can lead to increased participation and deeper cognitive involvement. Despite these correlations, motivation and engagement do not directly impact academic performance, emphasizing the need for urgent enhancements in teaching and learning strategies to promote motivation beyond mere grade attainment and external pressures. Likewise, student self-satisfaction does not directly correlate with academic performance, indicating that while satisfaction is important, it alone is insufficient to enhance academic achievement. The findings advocate for a comprehensive revision of educational methods, approaches, and strategies to better address and improve student performance.

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