



Learner Behavior, Student Engagement and Academic Performance: A Mixed-Methods Case Study of Cavendish University Uganda

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Abstract. Performance in higher education institutions (HEIs) and organizations is crucial as it enhances productivity, engagement, continuous improvement, and goal attainment. Despite these benefits, student performance in private universities remains a persistent concern. This mixed-method study examined the association between learner behavior, student engagement, and academic performance at Cavendish University Uganda (CUU). Quantitative data were collected from 196 undergraduate students using structured questionnaires, while qualitative data were obtained from 10 key informant interviews with deans, heads of department, academic staff, and students. Quantitative analysis revealed that learner behavior ($r = .353, p < .001$) and student engagement ($r = .439, p < .001$) had significant positive associations with academic performance. Together, they explained 20.6% of the variation in academic performance ($R^2 = .206, F(2, 193) = 25.044, p = .001$). However, regression results showed that student engagement demonstrated a strong unique association ($\beta = .355, p = .001$), while learner behavior was not statistically significant ($\beta = .142, p = .076$). Qualitative findings supported these results by providing contextual explanations. Participants emphasized that collaboration, active participation, regular attendance, and time management enhance students' understanding, motivation, and confidence. The study concludes that student engagement demonstrated a stronger unique association with academic performance than learner behavior when both variables were considered simultaneously. Therefore, higher education institutions should strengthen student engagement strategies while promoting positive learner behaviors to improve academic performance.

Keywords: (Learner behavior, Student engagement, Academic performance, Higher education, Private universities, Uganda).

1. Introduction

Performance is vital in higher education institutions (HEIs) and other organizations as it enhances productivity, engagement, talent retention, and goal setting; supports training needs; and fosters continuous improvement (Tao, 2025). In HEIs, academic performance reflects students' acquired knowledge, skills, and attitudes that influence future career prospects (Tan et al., 2025). It substantially affects individual success, institutional reputation, and societal advancement by producing competent graduates (Wang & Chen, 2025). Elger (2007) defined performance as the capacity to produce desired outcomes, highlighting the performer's active involvement in attaining them. Different scholars have viewed academic performance as a multidimensional concept. Yusuf and Adejoh (2016) define it as measurable student behavior over time, reflected in tests and assignments. Similarly, Kumar et al. (2021) relate it to achievement quantified by test scores, grades, and participation. Key attributes include previous academic records, accommodations, family support, gender, and environmental conditions like lighting and classroom layout (Angula et al., 2022; Alani et al., 2021; Wang & Chen, 2025).

1.1 Statement of the Problem

Higher education student performance is vital since it affects future career trajectories, adds to student academic achievement, and reflects on the quality of the institution itself (Bakar et al., 2023). But at Cavendish University Uganda (CUU), performance declined between 2019 and 2023, with 45% receiving poor grades and low instructional supervision scores of 2.41 (Emara et al., 2024). The shortage of PhD-qualified professors and unmotivated part-time staff undermines instructional quality (Alemiga & Kibukamusoke, 2019). A lack of sufficient IT systems to support online instruction for both staff and students, despite claims of a strong record

in innovative teaching modes, has resulted in inadequate monitoring of its implementation. Consequently, students have faced challenges that impede their ability to complete assessments efficiently (Kusasira et al., 2023; Omona et al., 2024). Technical difficulties, such as system outages and poor connectivity, have disrupted online services, leading students to perceive institutions as unsupportive (Kusasira et al., 2023). Therefore, this present study examined how learner behavior, students' engagement was associated with academic performance at Cavendish University Uganda.

1.2 General Objective

The study aimed to examine the association between learner behavior, student engagement and academic performance among students at Cavendish University Uganda. The following were the specific objectives:

- To examine the association of learner behavior on academic performance among students at Cavendish University Uganda.
- To examine the association student engagement on academic performance among students at Cavendish University Uganda.
- To examine the combined association of learner behavior and student engagement on academic performance among students at Cavendish University Uganda.

1.3 Research Questions

- How does learner behavior contribute to academic performance among students at Cavendish University Uganda?
- How does student engagement contribute to academic performance among students at Cavendish University Uganda?
- How do students and academic staff describe their experiences and views regarding learner behavior, student engagement, and academic performance at Cavendish University Uganda?

2. Literature Review

2.1 Theoretical review

The study was anchored in Constructivist Learning Theory, drawing on the work of Piaget and Vygotsky (1980) and Kuh's Student Engagement Theory (2001). Constructivism recognises learning as an active process in which learners construct new knowledge by integrating prior knowledge through interplay, inquiry, and reflection (Piaget, 1980). Vygotsky highlighted social and cultural contexts, affirming that learning occurs within the Zone of Proximal Development through scaffolding and support (Vygotsky, 1978). Language accelerates knowledge construction and cognitive growth (Piaget, 1980). Constructivism in higher education strengthens student engagement,

cooperation, critical thinking, and problem-solving through active, inquiry-based learning (Piaget, 1980).

Kuh's Student Engagement theory stresses that student achievement depends on the time and effort dedicated to learning and organisational support for engagement (Kuh, 2001; 2009). Academic engagement in terms of emotional, behavioral, and cognitive aspects promotes learning, perseverance, and cultivating reflection, motivation, and lifelong learning, which are vital for better academic performance (Kuh, 2001; 2009). Together, both theories champion student-centered learning that increases motivation, comprehension, and the development of lifelong learning skills fundamental for graduates.

2.2 Learner Behavior and Academic Performance

Learner behavior refers to the observable academic and classroom-related actions of students that reflect their engagement and motivation in the learning process (Saxena et al., 2024). It includes students' participation in learning activities, interaction in class, and their effort toward completing academic tasks. Learner behavior is influenced by motivational and socio-emotional factors that shape how students respond to learning demands and classroom environments (Skinner et al., 2016). With respect to the association of learner behavior with academic performance, Adrian Chin et al. (2022) investigated whether undergraduate learning behavior is a correlate of academic performance using Austin's model of student involvement and revealed a positive correlation. However, Adrian Chin et al.'s study was conducted outside Uganda and used student involvement, raising contextual and theoretical discrepancies. Qiu et al. (2022) employed a behavior classification model to examine the effect of learning behavior on the e-learning academic performance of students, and the findings revealed a significant effect. Nonetheless, the study created methodological and theoretical gaps. Swargiary (2023) conducted a comparative study regarding the relationship between the behavior of learners and academic performance and found that visionary learning behaviors are strongly related to the academic excellence of learners. However, Swargiary's study was quantitative, raising methodological gaps that call for the present study. Therefore, there remains a need to examine the relationship between learner behavior and academic performance in the present context.

2.3 Students' Engagement and Academic Performance

Student engagement has been defined in different but related ways in the literature. Kuh (2009) describes it as the time and effort students put into activities that contribute to learning outcomes, as well as the efforts by institutions to encourage such participation. Trowler (2010) adds that engagement is not one-dimensional but

includes behavioral, emotional, and cognitive aspects that together influence how students learn and perform.

Several studies have examined how engagement relates to performance, though in different settings and using different approaches. For example, Nachonga et al. (2021) studied engagement among academic staff at Makerere University and found a significant relationship with job performance, drawing on Herzberg's Two-Factor Theory. However, the study focused on staff rather than students, which limits how far the findings can be applied to learner engagement.

Anokye Effah and Nkwantabisa (2022), working within involvement theory, found that academic engagement has a strong positive association with student academic performance. Their study was, however, purely quantitative, which means it did not explore in depth how students actually experience engagement in learning. Opiyo et al. (2025) also reported that classroom engagement has a positive association with academic performance among secondary school students in Kenya, although the association was only moderate. This suggests that engagement may not have the same level of impact across different contexts. On the other hand, Bordbar et al. (2025) found that learning behaviors had a positive but not statistically significant relationship with academic performance, showing that the relationship is not always strong or consistent across studies.

Conclusively, the studies generally agree that student engagement is linked to academic performance, but they differ in context, theory, and strength of findings. This makes it important to further examine how engagement works in specific learning environments.

2.4 Combined association between Learner Behavior, Students engagement, and Academic performance

Previous studies indicate that learner behavior and student engagement are associated with academic performance. Li and Xue (2023), through a meta-analysis, recognized learning behavior as a critical factor influencing student engagement and academic performance. Wang et al. (2025) employed correlation and multiple regression analyses to show significant associations between online learning behavioral engagement and university students' academic performance. Though these findings align with student engagement theory, which conceptualizes engagement as students' behavioral, emotional, and cognitive involvement in learning, they mainly studied learner behavior and student engagement independently in relation to academic performance, with insufficient evidence examining their combined association, particularly in private university settings in Uganda. The current study addresses this discrepancy by examining the combined association between learner behavior, student engagement, and students' academic

performance at Cavendish University Uganda using a pragmatic paradigm.

3. Methodology

The study investigated the association between learner behavior, students' engagement, and academic performance at Cavendish University using a convergent parallel design. The design entails collecting quantitative and qualitative data simultaneously, analyzing data independently, and interpreting them together to give a comprehensive understanding of the association, and triangulating both data sets (Creswell, 2023). In particular, the qualitative component employed a case study design to gain an in-depth understanding of learner behavior, student engagement, and academic performance within the setting of Cavendish University Uganda (CUU). The qualitative participants comprised 10 key informants, including deans, heads of departments, academic staff, and students. Participants were selected purposively based on their roles and experiences critical to teaching, learning, student engagement, and academic performance. The integration of quantitative and qualitative results enabled the study to establish statistical associations while giving contextual interpretations of the observed patterns.

3.1 Sample/Study Group

A quantitative approach employed a stratified sampling technique in which the population was divided into faculties within the university. The Faculty of Science and Technology and the Faculty of Business and Management were selected because they contained the target population, specifically students from the Bachelor of Public Health and Bachelor of Business Administration programmes, while other faculties were excluded due to smaller populations that were not suitable for reliable analysis. Thereafter, simple random sampling was used to select respondents from the identified strata, giving all eligible students an equal chance of participation. A sample size of 205 was determined from a population of 440 using the Krejcie and Morgan (1970) table, and 205 questionnaires were distributed. Of these, 198 were returned, but 2 were excluded for incompleteness, resulting in 196 valid responses for analysis. Data were collected at a single point in time using a self-administered questionnaire administered to eligible students from the selected programmes and year of study.

So:

$$F(2,193) = 25.044$$

is consistent with $N = 196$.

3.2 Data Collection

Data Collection Methods / Tools. Quantitative data were collected from respondents using a questionnaire survey. The study employed self-administered questionnaires to collect quantitative data on the hypotheses at one point

in time. The researcher reached out to participants for first-hand data collected through semi-structured key informant interviews. The interviews explored participants' experiences and views regarding learner behavior, student engagement, and academic performance. Interviews were conducted individually, with participants encouraged to give detailed insights into their experiences. The interviews were documented and prepared for analysis while preserving participants' confidentiality and anonymity.

3.3 Measurement Tool

This study investigated the association between learner behavior, students' engagement (explanatory variables), and students' academic performance (outcome variable). Academic performance was assessed using three dimensions: diagnostic, formative, and summative assessment. The measures were adapted from the Assessment Practices Inventory developed by Zhang and Burry-Stock (2003) and the Assessment for Learning framework of Black and Wiliam (1998).

Diagnostic assessment was studied in terms of pre-assessment, formal assessment, and non-formal assessment, using a questionnaire survey (Kraus & Minstrell, 2002). Formative assessments were examined in four aspects, namely: classroom discussions, brief quizzes, peer and self-assessment, and observation (Kulasegaram et al., 2018). Summative evaluation was examined in terms of final examinations and, end of course, grades (Brownlie et al., 2024). The development of the instrument entailed examining existing approved tools to choose applicable measures for the study. The survey used a five-point Likert scale, ranging from 'strongly disagree' (1) to 'strongly agree' (5), to gauge the attributes and test the relationship between learner behavior, engagement (predictors), and academic performance (outcome). The quantitative data were first coded and then analyzed using SPSS, with both descriptive and inferential statistics applied to investigate

the effect of learner behavior and students' engagement on academic performance. Trustworthiness of qualitative data was ensured by developing an interview guide with the guidance of experts in the subject with respect to the research questions.

3.4 Data Processing

The quantitative data were first coded and then analyzed using SPSS, with both descriptive and inferential statistics applied to examine the results. The qualitative data were transcribed and analyzed using thematic analysis to find patterns.

3.5 Data Analysis

The analysis of quantitative data at the univariate level used descriptive statistics. The Pearson correlation coefficient was used to establish the association between learner behavior and students' engagement and the dependent variable (DV), academic performance. A multiple linear regression was then conducted to examine the combined association of learner behavior and student engagement with academic performance and the unique association of each explanatory variable with the dependent variable. The qualitative data were analyzed thematically. The analysis involved familiarization with the interview data, identification of meaningful statements, generation of initial codes, grouping of related codes into subthemes, and development and refinement of overarching themes. The themes were then interpreted in relation to the study objectives and the quantitative findings. Both quantitative and qualitative findings were incorporated at the interpretation stage following independent analysis of the two data strands. The results from the two strands were compared to establish areas of convergence, complementarity, and divergence, thereby giving a fused interpretation of learner behavior, student engagement, and academic performance.

4. Findings

4.1 Demographic Characteristics

Table 1: Descriptive Results for Bio data

Item	Categories	Frequency	Percent
A1 Age of the respondents	19-23	48	24.5
	24-29	72	36.7
	30 and above	76	38.8
	Total	196	100.0
A2 Gender	Male	70	35.7
	Female	126	64.3
	Total	196	100.0
A3 Year of study	Year Two	100	51.0
	Year three	96	49.0
	Total	196	100.0
A4 Type of Faculty	Business and management	72	36.7

	Sciences and Information Technology	124	63.3
	Total	196	100.0
A5 What is your program?	ICT/Computer Science	64	32.7
	Business Administration	32	16.3
	Software Engineering	54	27.6
	Environmental Health/ Public Health	46	23.5
	Total	196	100.0
A6 How do you perform? Excellent		16	8.2
	Very good	12	6.1
	Good	82	41.8
	Average	58	29.6
	Not good	28	14.3
	Total	196	100.0

Table 1 Table 1 presents the demographic characteristics of the 196 respondents included in the study. The study comprised 196 respondents. The biggest proportion of respondents were aged 30 years and above (38.8%), followed by those aged 24–29 years (36.7%) and 19–23 years (24.5%). Females composed the majority of respondents (64.3%), compared with males (35.7%). Concerning year of study, 51.0% were in Year Two, and 49.0% were in Year Three. The majority of respondents belonged to the Sciences and Information Technology faculty (63.3%), while 36.7% were from Business and Management. ICT/Computer Science had the biggest proportion of respondents (32.7%), followed by Software Engineering (27.6%), Environmental Health/Public Health (23.5%), and Business Administration (16.3%). Concerning self-reported academic performance, the largest proportion rated their performance as good (41.8%), followed by average (29.6%), not good (14.3%), excellent (8.2%), and very good (6.1%).

Academic Performance

The academic performance of students was studied in three constructs, i.e., diagnostic, formative, and summative assessments. The results are shown in Table 2:

Table 2: Mean and Standard Deviation of Academic performance items

Constructs	Mean	Standard Deviation
Diagnostic assessment	4.0327	.93707
Formative Assessment	4.0367	.98308
Summative Assessment	4.2380	.69275

The findings reveal that summative assessment was the most highly ranked assessment practice ($M = 4.2380$, $SD = 0.69275$), followed by formative assessment ($M = 4.0367$, $SD = 0.98308$) and diagnostic assessment ($M = 4.0327$, $SD = 0.93707$). The high mean scores indicate that respondents mostly perceived the three forms of assessment as highly practiced at Cavendish University Uganda. The relatively low standard deviation for summative assessment suggests higher consistence in respondents' perceptions of its implementation.

The qualitative results confirmed these quantitative findings by demonstrating the practical application of formative and summative assessment. One participant reported that the *CUU CLaned platform provides weekly essays and quizzes, which require continuous study, while end-of-semester examinations account for 70% of the final grade (K11-2)*. The regular essays and quizzes give evidence of continuous formative assessment and help expound its high ranking ($M = 4.0367$). Likewise, the considerable weighting of end-of-semester examinations gives qualitative support for the higher ranking acquired for summative assessment ($M = 4.2380$). Therefore, the qualitative evidence complements the quantitative results by proving that students experience assessment through both continuous exercises and end-of-semester examinations. Never the less, the available qualitative evidence gives limited insight into diagnostic assessment, given its relatively high quantitative rating ($M = 4.0327$). Generally, the confluence of the findings indicates that academic performance at the university is well entrenched, with summative assessment occupying a specifically leading position in the assessment process.

Table 3: Mean and Standard Deviation of Learners' behaviour (LB) and Students Engagement items

Constructs	Mean	Standard Deviation
Learner Behavior	4.0327	.93707
Students' Engagement	4.0367	.98308

The results in the table indicate that student engagement had the highest mean score ($M = 4.0367$, $SD = 0.98308$), while learner behavior had a slightly lower mean score ($M = 4.0327$, $SD = 0.93707$). The high mean scores suggest that

respondents mostly perceived both learner behavior and student engagement positively. The close mean scores indicate that the two constructs were ranked at almost the same level among students. The standard deviations suggest moderate variation in respondents' opinions, with student engagement exhibiting slightly greater variability than learner behavior. Altogether, the findings indicate that students showed positive learner behavior and were actively involved in the learning process.

The qualitative findings confirmed these findings by emphasizing the university and learning practices that support positive learner behavior and student engagement. One participant clarified that "good learner behavior at CUU is encouraged through participation, positive study habits, motivation, and institutional support, including mentorship and collaborative learning" (KII-1). This result confirms the relatively high mean score for learner behavior ($M = 4.0327$) by suggesting that positive behaviors are reinforced through both individual practices and university support practices. Likewise, another participant reported that "learners are engaged through active participation in learning, utilization of resources, development of skills, motivation, and commitment" (KII-5). This account reinforces the high mean score for student engagement ($M = 4.0367$) by explaining how active participation, access to learning resources, motivation, and commitment are associated with students' engagement in the learning process. Both the quantitative and qualitative findings convey that positive learner behavior and student engagement at CUU are supported by collaborative learning, mentorship, motivation, active involvement, and opportunities for skill development. The merge of the two strands of evidence thus indicates that the university's learning environment provides conditions that promote both appropriate learner behavior and active engagement in learning.

4.2 Testing hypotheses

4.2.1 Pearson correlation of learner behavior and academic performance

The study went further and examined the association between learner behavior and students' academic performance. Inferentially, the researcher conjectured to carry out correlations:

H_1 : Learner behavior has a significant association with academic performance at Cavendish University, Uganda.

H_0 : Learner behavior has no significant association with academic performance at Cavendish University, Uganda.

A Pearson correlation coefficient was run to test the association. The findings of Pearson's correlation coefficient for learner behavior and students' academic performance at Cavendish University, Uganda, are in Table 5.

Table 5: Pearson's correlation coefficient index between Learner Behavior and students' academic performance

		Learner Behavior	Students' academic performance
Learner Behavior	Pearson Correlation	1	.353**
	Sig. (2-tailed)		.001
	N	196	196
Students' academic performance	Pearson Correlation	.353**	1
	Sig. (2-tailed)	.001	
	N	196	196

Results of Pearson's correlation coefficient revealed a significant positive association between learner behavior and academic performance ($r = .353$, $n = 196$, $p < .001$). The finding suggests that students who showed more positive learner behaviors are *inclined* to report higher academic performance. Hence, the hypothesis that learner behavior is significantly associated with academic performance was supported.

The qualitative perspective aimed to answer research question one: To explore students' experiences of how learner behavior contributes to their academic performance at Cavendish University Uganda.

The qualitative findings provided further insight into how respondents were asked to share their experiences of how learner behavior may contribute to academic performance. When participants were asked how learner behavior contributes to students' academic performance, one participant noted:

"In my opinion, as a student, learner behavior enhances class participation, while pedagogical quality, career significance, institutional support, and peer engagement promote academic performance" (KII-6).

This qualitative account confirms the quantitative results by clarifying the possible mechanisms through which learner behavior is associated with academic performance. In particular, class participation conveys an observable learner behavior

that may boost students' engagement in learning tasks, while peer engagement and university support may create conditions that promote such behavior. Thus, qualitative evidence helps clarify the positive association identified quantitatively, although it also indicates that academic performance is shaped by factors beyond learner behavior, including pedagogical quality and university support. Generally, the convergence of the two strands of evidence indicates that positive learner behaviors, especially active participation and engagement with peers, are associated with better academic performance at Cavendish University Uganda.

4.2.2 Student engagement and academic performance

The researcher also went ahead to test the hypothesis with the postulate that:

H₂: Students' engagement has a significant association with academic performance at Cavendish University Uganda, using the Pearson Correlation coefficient.

H₀₂: Students' engagement has no significant association with academic performance at Cavendish University Uganda.

Table 5: Pearson's correlation coefficient index between students' engagement and students' academic performance

		Students' Engagement	Academic performance
Students' Engagement	Pearson Correlation	1	.439**
	Sig. (2-tailed)		.001
	N	196	196
Academic performance	Pearson Correlation	.439**	1
	Sig. (2-tailed)	.001	
	N	196	196

The Pearson correlation analysis results indicated a moderate, positive, and statistically significant relationship between students' engagement and academic performance, $r = .439$, $p = .001$, $N = 196$. This finding suggests that higher levels of student engagement were associated with better academic performance. Since the p -value was below the 0.05 significance level, the null hypothesis of no significant association between students' engagement and academic performance was rejected. The finding therefore provides empirical support for the hypothesis that students' engagement is significantly related to academic performance.

The qualitative strand aimed to answer the research question: To explore students' experiences of how student engagement contributes to their academic performance at Cavendish University Uganda.

Participants shared their experiences that supported the quantitative results by emphasizing the significance of active participation, motivation, skill development, resource utilization, and seeking feedback in advancing students' engagement and academic performance. One key informant alluded to:

"In this department, students demonstrate engagement through active participation, resource utilization, motivation, skill development, and seeking feedback on their assignments." (KII-3)

The results confirm the quantitative evidence by emphasizing how student engagement is displayed in the university context. Active participation in learning activities, motivation to learn, development of academic skills, effective utilization of available learning resources, and seeking feedback may give students opportunities to reinforce their learning and improve their academic performance. Therefore, the pragmatic interpretation of the findings suggests that reinforcing students' engagement may enhance academic performance at Cavendish University Uganda.

4.2.3 Learner behavior, students' engagement and academic performance

Additionally, multiple linear regression analysis was conducted to determine the combined association between learner behavior, students' engagement to academic performance. The following hypotheses were tested, and the results are presented in Table 6.

H₃: Learner behavior and student engagement have a combined significant relationship with academic performance at Cavendish University Uganda.

H₀₃: Learner behavior and student engagement have no combined significant relationship with academic performance at Cavendish University Uganda.

Table 6: Regression Analysis Learner Behavior, students' engagement, and Students' Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.454a	.206	.196	.62046

The results suggest a moderate positive multiple association between learner behavior, student engagement, and academic performance ($R = .454$). The model explained 20.6% of the variance in students' academic performance, while the adjusted R^2 was .196, showing that about 19.6% of the variance was explained after adjustment for the number of indicators.

These findings indicate that learner behavior, encompassing growth mindset, active learning, accountability, and knowledge sharing, together with student engagement, including cognitive, emotional, social, and collaborative engagement, are important factors associated with students' academic performance.

The quantitative results were further backed by the qualitative evidence. The results were based on the research question: How do students and academic staff describe their experiences and views regarding learner behavior, student engagement, and academic performance at Cavendish University Uganda? Participants were asked to narrate their experiences of academic engagement and clarify how class attendance and participation influenced their academic performance.

For example, KII-9 stated:

"As a student, regular revision and active class participation enhance my understanding, confidence, and overall academic performance." (KII-9)

The responses highlighted the relevance of regular revision, regular class attendance, and active participation in classroom activities. Participants expounded that these behaviors improved students' understanding of course content, reinforced their confidence, and contributed to improved academic performance. This qualitative voice commends the regression results by clarifying how active engagement in learning activities may be mirrored in students' academic experiences. Regular revision and involvement give students opportunities to reinforce their understanding, build esteem, and strengthen their learning, thereby enhancing the observed relationship between learner behavior, student engagement, and academic performance.

Table 7: ANOVA on LB and SET on Academic Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.282	2	9.641	25.044	.001
	Residual	74.299	193	.385		
	Total	93.581	195			

The results presented in Table 8 show that the overall multiple regression model was statistically significant, $F(2, 193) = 25.044$, $p = .001$. This finding suggests that learner behavior and student engagement, when combined together, were significantly associated with students' academic performance. The two explanatory variables jointly accounted for a statistically significant proportion of the variation in academic performance. Therefore, the research hypothesis that learner behavior and student engagement have a combined significant association with academic performance at CUU was supported, while the null hypothesis was rejected.

The quantitative findings were further supported by the qualitative evidence. Participants were asked to describe their level of engagement in classroom activities and explain how such engagement contributes to their academic performance. They were also asked how time management contributes to their academic performance. Regarding classroom engagement, KII-10 alluded:

"As a learner in this faculty, I try my best at all times to attend all my lectures and engage in class discussions, but occasionally when I miss lectures, I observe it impacts my performance." (KII-10)

This response clarifies the relevance of regular attendance and active involvement in supporting students' academic performance. It indicates that engagement extends beyond mere attendance to comprise of active involvement in classroom discussions and learning activities. In contrast, missing lectures may restrict students' exposure to subject matter and opportunities for engagement, which may negatively affect their academic performance.

Concerning time management, KII-7 observed:

"Balancing my classwork and personal duties is vital. When I do not observe time management, I submit my coursework after deadlines, which lowers grades." (KII-7)

The response emphasizes time management as a crucial aspect of students' learning behavior. Effective management of academic and personal duties allows students to finish coursework within the mandatory deadlines, while time procrastination may lead to late submission of assignments, resulting in lower academic grades.

Similarly, one participant noted that:

“As a student, I ensure that consistent attendance, active participation, and effective time management are essential for achieving good performance, as missing lectures or poor time management can negatively impact grades.”

The integration of the quantitative and qualitative findings provides a consistent account of the relationship between learner behavior, student engagement, and academic performance. While the regression analysis established that learner behavior and student engagement jointly had a statistically significant association with academic performance, the qualitative findings provided contextual explanations of how these factors are experienced in students’ daily academic lives. Specifically, students identified regular class attendance, active participation, consistent engagement, and effective time management as important practices that support their academic work. The qualitative evidence therefore complements and enriches the quantitative findings, providing a more comprehensive understanding of the relationship between learner behavior, student engagement, and academic performance at Cavendish University Uganda.

Table 8: Correlation coefficient of LB, SET, and overall SAP

	Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Tolerance	Statistics VIF
1	(Constant)	2.805	.214		13.099	.001		
	Learner Behavior	.105	.059	.142	1.783	.076	.647	1.546
	Students' Engagement	.250	.056	.355	4.450	.001	.647	1.546

The coefficients presented in Table 9 indicate that learner behavior was a positive but statistically non-significant unique predictor of academic performance ($B = .105$, $\beta = .142$, $p = .076$). In contrast, student engagement was a positive and statistically significant unique predictor of academic performance ($B = .250$, $\beta = .355$, $p = .001$). Therefore, when the two predictors were considered concurrently, student engagement proved a stronger and statistically significant unique association with academic performance than learner behavior.

The regression equation was stated as:

$$\text{Academic Performance} = 2.805 + 0.105(\text{Learner Behavior}) + 0.250(\text{Student Engagement})$$

The results thus indicate that student engagement has a stronger unique statistical association with academic performance than learner behavior in the joint model. Though learner behavior was positively associated with academic performance, its unique contribution was not statistically significant after accounting for student engagement.

Additionally, the collinearity statistics suggested that there was no evidence of problematic multicollinearity between the predictors. Both students’ engagement and learner behavior registered a tolerance value of .647 and a variance inflation factor (VIF) of 1.546, suggesting that the predictors were adequately separate for inclusion in the regression model.

The qualitative findings gave contextual support for the quantitative findings. Participants stressed regular revision, class attendance, active participation, and seeking feedback as practices linked to positive academic performance. For instance, KII-9 described regular revision and active class participation as practices that supported understanding, confidence, and academic performance. These narrative accounts provide contextual insight into the quantitative results that student engagement made the stronger unique contribution to academic performance.

Table 9: Qualitative themes and subthemes

Themes	Subthemes	Main illustrative evidence
Promotion of Positive Learner Behaviour	Collaboration; Accountability; Mentorship	Participants explained that positive learner behavior is promoted through mentorship, collaborative learning, class participation, and responsible study habits, which encourage supportive peer interaction and academic responsibility (KII-1, KII-6).
Student Engagement in Learning Activities	Participation; Peer Collaboration; Interactive Pedagogy	Respondents emphasized that active participation in class discussions, teamwork, utilization of learning resources, and interactive teaching approaches strengthen student engagement and improve learning experiences (KII-3, KII-4, KII-5).
Factors Enhancing Academic Performance	Attendance; Time Management; Balance	Participants noted that regular class attendance, revision practices, balancing coursework with personal responsibilities, and effective time management contribute positively to academic performance (KII-7, KII-9, KII-10).

Institutional and Pedagogical Support	Guidance; Growth Mindset; Interactive Learning	Interviewees highlighted that continuous academic guidance, mentorship, interactive learning methods, and encouragement from lecturers support student motivation, confidence, and academic achievement (KII-4, KII-6).
Interconnectedness of Behaviour, Engagement & Performance	Behaviour; Engagement; Engagement; Performance; Support; Effort	Participants described learner behavior, engagement, institutional support, and personal effort as interconnected factors that collectively influence students' academic performance and overall learning outcomes (KII-4, KII-6, KII-10).

Positive behaviour, active engagement, effective support systems, and disciplined practices are key drivers of student academic performance.

Table 10: Joint display table of Quantitative and qualitative findings

Construct	Quantitative Findings	Qualitative Themes	Integrated Interpretation
Learner Behavior	Learner behavior was positively and significantly associated with academic performance ($r = .532, p < .001$). However, when together with student engagement, it was not a statistically significant unique predictor of academic performance ($B = .105, \beta = .142, p = .076$).	Discipline, collaboration, mentorship, and positive classroom behavior (KII-1, KII-4, KII-6).	Learner behavior is positively associated with academic performance, with qualitative findings emphasizing discipline, collaboration, mentorship, and positive classroom behavior. However, its unique association becomes weaker when considered simultaneously with student engagement.
Student Engagement	Student engagement was positively and significantly associated with academic performance ($r = .568, p < .001$) and was also a statistically significant unique predictor when considered together with learner behavior ($B = .250, \beta = .355, p = .001$).	Active participation, feedback seeking, motivation, time management, and class involvement (KII-3, KII-7, KII-9).	Student engagement established a stronger unique association with academic performance, congruent with qualitative results highlighting participation, feedback seeking, motivation, time management, and class involvement.
Combined Model (LB & SET)	The overall multiple regression model was statistically significant, $F(2, 193) = 25.044, p = .001$, with the two constructs jointly accounting for 20.6% of the variation in academic performance ($R^2 = .206$; adjusted $R^2 = .196$) variation in performance	Students emphasize attendance, revision habits, and structured learning routines	Both constructs were jointly associated with academic performance, though student engagement demonstrated the stronger unique association within the combined model.

5. Discussion

The findings emphasize that learner behavior and student engagement are significantly associated with academic performance at Cavendish University Uganda (CUU). However, the findings also indicate a crucial distinction between the bivariate relationships and the joint regression model. Whereas both learner behavior and student engagement were positively and significantly associated with academic performance at the bivariate level, student engagement surfaced as the only statistically significant unique predictor when both variables were entered concurrently into the regression model. The combined model was statistically significant

and accounted for 20.6% of the variance in students' academic performance. These results give a subtler understanding of the separate contributions of learner behavior and student engagement to academic performance.

5.1 Learner Behavior and Academic Performance

The first objective examined the association between learner behavior and students' academic performance. The findings indicated a positive and statistically significant relationship between learner behavior and academic performance. This shows that students who exhibit positive learning behaviors, including active

participation, accountability, collaboration, regular revision, and constructive relationships with peers, tend to report better academic performance. The qualitative results reinforce this interpretation, with participants underscoring discipline, collaboration, mentorship, class participation, and positive classroom behavior as critical features of students' academic performance. The qualitative evidence thus gives contextual insight into the positive association noted in the quantitative findings. The finding is consistent with the constructivist perspective, which underscores active participation, interaction, and the learner's active role in constructing knowledge. From this viewpoint, students who actively participate in learning activities and relate with peers and lecturers may have greater opportunities to engage with course content and consolidate their comprehension.

The findings align with Constructivist Theory (1936), which emphasizes active learning and interaction in knowledge construction, and are supported by Swargiary (2023), who found that positive learner behaviors are significantly associated with academic performance. Importantly, the multiple regression analysis gives a more distinct interpretation. When learner behavior and student engagement were considered concurrently, learner behavior had a positive but statistically non-significant unique association with academic performance ($B = .105, \beta = .142, p = .076$). This suggests that though learner behavior was significantly associated with academic performance at the bivariate level, its unique contribution was not statistically significant after student engagement was considered. This distinction is crucial because the bivariate association captures the general association between learner behavior and academic performance, while the regression coefficient represents the unique contribution of learner behavior whilst controlling for student engagement. This finding is supported by Bordbar et al. (2025), who found that learning behaviors are positively associated with performance but may not always be statistically significant when other academic factors are considered.

5.2 Student Engagement and Academic Performance

The second objective examined the association between student engagement and academic performance. The Pearson correlation analysis suggested a moderate, positive, and statistically significant association between student engagement and academic performance ($r = .439, p = .001, N = 196$). Therefore, higher levels of student engagement were associated with better academic performance. The null hypothesis asserting that there was no significant association between student engagement and academic performance was therefore rejected.

The qualitative results give further contextual support for this result. Participants depicted student engagement in terms of active involvement, motivation, development of academic skills, effective utilization of learning resources, and seeking feedback. These experiences

indicate that engagement is expressed through students' active participation in academic activities and their efforts to get and utilize learning support.

The finding concurs with Kuh's Student Engagement Theory, which highlights the critical role of students' participation in educationally tenacious activities. Students who participate actively in learning, seek feedback, utilize available resources, and consistently participate in academic activities are most likely to get opportunities for learning and academic development. The finding also aligns with Çali et al. (2024), cited in the study, who reported that behavioral engagement was a relevant predictor of academic performance.

The regression analysis further reinforces the relevance of student engagement in the current study. When learner behavior and student engagement were integrated into the model concurrently, student engagement remained a statistically significant unique predictor of academic performance ($B = .250, \beta = .355, p = .001$). Its standardized coefficient was greater than that of learner behavior ($\beta = .142$), suggesting that student engagement made the stronger unique association with academic performance in the joint model. This finding indicates that active student engagement may be specifically crucial in the CUU context. Engagement gives students with opportunities to interact with course content, involve in learning activities, and receive feedback, which may help explain its stronger unique contribution to academic performance. This finding aligns with Opiyo et al. (2025) also reported that classroom engagement has a moderate positive association on academic performance among secondary school students.

5.3 Combined Association of Learner Behavior and Student Engagement with Academic Performance

The third objective examined the combined association between learner behavior, student engagement, and academic performance. The multiple regression model was statistically significant, $F(2, 193) = 25.044, p = .001$, with $R = .454, R^2 = .206$, and adjusted $R^2 = .196$. The model therefore explained 20.6% of the variance in students' academic performance. This finding shows that learner behavior and student engagement, combined, provide a statistically significant explanation of variation in academic performance. This finding agrees with Wang et al. (2025), who found a significant association between students' online learning behavioral engagement and academic performance, highlighting the importance of students' active learning behaviours in achieving positive academic performance.

6. Conclusion

The study findings revealed that learner behavior and students' engagement had a significant positive association with the academic performance of students at CUU, with students' engagement emerging as the

strongest unique predictor, driven by active involvement, motivation, and seeking guidance.

Multiple regression analysis indicated that student engagement continued to be a significant and stronger unique predictor of academic performance, while learner behavior was no longer statistically significant when both variables were included together. Though learner behavior was significantly associated with academic performance at the bivariate level, its unique contribution was not significant after accounting for student engagement.

Moreover, it was found that learner behavior and student engagement, examined together, significantly affect students' academic performance at CUU, which may explain about 20.6% of the variation in students' academic performance. Collinearity diagnostics did not demonstrate any collinearity issue (multicollinearity problem is not significant).

In general, higher student engagement was associated with better academic performance, whilst positive learner behavior remained significant.

7. Recommendations

The study reveals that student engagement had a significant unique association with academic performance, whereas learner behavior did not have a statistically significant unique association when both variables were examined simultaneously. The study recommends that higher education institutions (HEIs) strengthen programs that inspire positive behaviors, including regular class attendance, discipline, and promptness, through guidance initiatives and acknowledgement of commendable conduct. HEIs' teaching staff should adopt and implement rewarding and interactive teaching methods, such as group discussions and regular feedback, to keep students actively engaged and motivated, thereby enhancing their academic performance. HEIs should strengthen institutional support systems to enhance student engagement.

8. Limitations

This study was limited to examining the association between learner behavior, student engagement, and students' academic performance, while other potential factors associated with academic performance such as teaching quality, learning resources, motivation, and institutional support were not included. Furthermore, the correlational design prevented time-related changes from being observed, and, finally, the use of self-report data could be subject to response bias. The study was conducted in only one institution (CUU), limiting generalizability.

9. Future Research

Future research should assess the role of learner behavior and engagement across multiple universities, considering additional factors and using advanced methods to understand their association with academic performance.

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