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Not peer-reviewed version

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Posted Date: 18 September 2024

doi: [10.20944/preprints202409.1372.v1](https://doi.org/10.20944/preprints202409.1372.v1)

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Article

Self-Esteem, Student Engagement, and Academic Performance in Universitas Terbuka, Indonesia

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Abstract: Self-esteem and student engagement play critical roles in shaping academic performance, particularly in the context of distance education, where direct classroom interaction is limited. This preliminary study examines the relationships between self-esteem, student engagement, and academic performance among 1,479 students at an Indonesia's open university, Universitas Terbuka. Using a cross-sectional survey design, the study employed multiple validated scales, including the Rosenberg Self-Esteem Scale, Student Engagement Scale, and self-reported academic performance measures, to explore how these variables interact. The results show that self-esteem alone does not significantly predict academic performance ($F = 2.31$, $p = 0.071$), but student engagement plays a moderating role, significantly enhancing the effect of self-esteem on academic outcomes (interaction term: $B = 0.25$, $p = 0.010$). Additionally, students from matrilineal family systems reported significantly higher self-esteem ($M = 3.92$, $SD = 0.569$, $p = 0.014$) and academic engagement ($M = 3.93$, $SD = 0.870$, $p < 0.001$) compared to their patrilineal counterparts. These preliminary findings highlight psychological and cultural factors in online education, with ongoing qualitative analyses in a broader mixed-method study set to deepen insights into technology challenges and further contribute to distance learning research.

Keywords: Self-esteem; Student engagement; Academic performance; Distance education; Family systems

1. Introduction

The relationship between self-esteem, student engagement, and academic performance has been widely explored in various educational contexts, yet the dynamics within distance education, particularly in the Indonesia's Open University, Universitas Terbuka (UT), remain under-examined. The distinctive nature of distance learning, which often lacks the face-to-face interactions found in traditional classroom settings, raises unique challenges for student motivation and academic success. Existing research on the interaction between psychological factors and academic outcomes highlights the importance of understanding how self-esteem, engagement, and other related factors contribute to academic performance in such environments.

1.1. Self-Esteem and Academic Performance

While self-esteem is often associated with well-being and confidence, its direct impact on academic performance is less clear. Several studies have found that self-esteem, when considered in isolation, does not necessarily correlate with higher academic achievement. For instance, Kasyoka (2023) found that many students reported high levels of self-esteem regardless of their academic performance, suggesting that self-esteem may not be a decisive factor in determining academic success. Instead, other factors such as effective learning strategies and habits seem to play a more crucial role in influencing student outcomes (Neroni et al., 2022; Saeed et al., 2023).

This raises an important gap in the literature: while self-esteem contributes to students' overall psychological well-being, its role as a predictor of academic success, particularly in distance education, remains ambiguous. This gap underscores the need to examine whether self-esteem

interacts with other factors, such as student engagement, to influence academic performance more significantly.

1.2. Student Engagement in Online Learning

In online and distance learning environments, student engagement emerges as a crucial factor for academic success. Research has consistently shown that higher levels of engagement, particularly in terms of active participation and emotional investment in learning, are strongly linked to better academic outcomes (Ismail et al., 2023; Ong & Quek, 2023; Vermeulen & Volman, 2024). Engagement in these contexts is shaped by the quality of student-instructor interactions, teaching methods, and the overall learning environment.

For example, a study by Ismail et al., (2023) found that students in open distance learning (ODL) settings who experienced frequent and meaningful interaction with instructors were more likely to be engaged and perform better academically. Furthermore, motivation and perceived creative teaching behaviors (P-CFTB) were found to enhance student engagement, contributing to nearly half (48%) of the variance in learning engagement (Skinner, 2023; Sun & Shi, 2024).

Despite these findings, the question remains as to how student engagement moderates the relationship between self-esteem and academic performance. While engagement has been identified as a mediator in various contexts, its specific role as a moderator in distance learning environments, where students face unique challenges, is less understood.

1.3. Student Academic Performance

Academic performance is shaped by an array of factors, including psychological well-being, lifestyle behaviors, and educational practices. In the context of online learning environments such as Universitas Terbuka, the role of student engagement and the integration of Information and Communication Technology (ICT) are crucial for determining student success. Previous research highlights the influence of factors such as healthy lifestyle choices, metacognitive strategies, and psychological interventions in improving student outcomes. For instance, healthy lifestyle choices, including adherence to a Mediterranean diet and regular physical activity, are associated with higher academic engagement and better academic performance (Cano-Cañada et al., 2024; Ojeleye et al., 2023). Similarly, metacognitive interventions, which encourage students to reflect on their learning processes, have been shown to positively influence academic performance through improved preparedness and higher GPAs (Dewsbury et al., 2024; K. Li et al., 2024; Ojeleye et al., 2023).

In addition, the integration of sports and physical activity into students' daily routines can enhance their time management and cognitive function, thereby boosting their academic performance. However, it is important to balance extracurricular activities such as sports to prevent academic neglect (Nguri, 2024). Another significant factor influencing academic performance is psychological well-being, as mindfulness-based stress reduction programs have been shown to alleviate anxiety and stress, leading to better academic outcomes (Swargiary & Roy, 2023). As these diverse influences converge, a holistic approach that integrates these lifestyle, psychological, and educational strategies may prove most effective in fostering academic success for students, particularly in distance learning environments.

1.4. Challenges and Technological Integration

In several studies, it has been recognized that Information and Communication Technology (ICT) is essential in online learning environments (Cojocariu & Mareş, 2022; Inegbedion, 2024; Sun & Shi, 2024). Students need proficiency in technological platforms to succeed in their studies. Unlike traditional settings, online learning heavily relies on ICT for accessing materials, participating in discussions, and completing assignments, and student's adept in using these tools tend to perform better academically.

Effective ICT integration can enhance student engagement by making learning more interactive and accessible (Sun & Shi, 2024; Wu et al., 2023). However, at Universitas Terbuka, ICT proficiency

varies significantly among students due to geographical and demographic factors. This lack of a standardized instrument for assessing ICT skills limits a detailed investigation of its impact in this study. Future research should focus on developing such tools to better understand the relationship between ICT proficiency, engagement, and academic performance.

Additionally, the digital divide presents a challenge, as not all students have equal access to technology. Enhancing ICT literacy and infrastructure is crucial to ensure equitable participation in online learning environments. This study serves as a preliminary investigation into these issues, aiming to guide future research in improving academic outcomes through technology integration.

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1.5. Research Questions

Building on the gaps identified in existing literature, and focusing on the specific challenges of distance learning environments at Universitas Terbuka, this study seeks to address the following research questions:

1. How does the self-system of motivational development, including self-esteem, influence academic performance among students at Universitas Terbuka, while accounting for variations in gender, length of study, and regional background?
2. How does student engagement moderate the relationship between the self-system of motivational development, particularly self-esteem, and academic performance in the context of distance learning at Universitas Terbuka?
3. How does student engagement influence students' perceptions of the learning environment (learning climate), and what role does this play in shaping academic-related behaviours and perceptions at Universitas Terbuka?

2. Method

As mentioned above, this study aimed to examine the relationships between self-esteem, student engagement, and academic performance among students at Universitas Terbuka, focusing on the moderating role of student engagement and the impact of family systems. The following sections outline the research design, participants, instruments, and statistical techniques used in this study, ensuring a comprehensive approach to answer the research questions.

2.1. Research Design

This research employed a cross-sectional survey design to capture data from a diverse sample of Universitas Terbuka students. The design allowed for the examination of the relationship between psychological variables (self-esteem, student engagement) and academic outcomes at a single point in time. Given the unique nature of distance learning, this design was particularly suitable for assessing the factors that influence academic success in a non-traditional learning environment.

2.2. Participants and Sampling Technique

A total of 1,479 students from Universitas Terbuka participated in this study. The sample was obtained using a convenience sampling technique followed by snowball sampling to expand the diversity of participants. This method facilitated the inclusion of students from various regional backgrounds, different study lengths, and two distinct family systems (matrilineal vs. patrilineal). The goal was to ensure that the sample was representative of the broader student body at Universitas Terbuka, allowing for a more comprehensive analysis of the variables in question.

2.3. Instruments

In the broader parent study from which this article is derived, five validated instruments were utilized to comprehensively measure self-esteem, student engagement, academic performance, and perceptions of the learning environment. However, this article specifically focuses on addressing three distinct research questions, necessitating a more focused selection of instruments. To ensure

coherence with the research objectives, only the instruments directly related to self-esteem, student engagement, and academic performance were employed, while others were excluded due to their limited relevance to the core investigation.

The chosen scales were carefully selected as they most effectively contribute to understanding the dynamics of motivational development, engagement, and academic outcomes within the distance learning context of Universitas Terbuka. Furthermore, while the broader parent study includes collaboration with three other face-to-face universities in Indonesia, this article limits its scope to the context of distance education at Universitas Terbuka. This targeted focus allows for a deeper examination of the unique challenges and opportunities presented by online learning environments, which differ significantly from traditional face-to-face settings.

The three selected instruments align directly with the research questions by providing reliable and valid measures to assess how self-esteem and engagement influence academic performance, as well as how engagement shapes students' perceptions of their learning climate. In contrast, the excluded instruments—while useful in broader educational contexts—were not deemed essential for examining the specific relationships targeted in this article. The following table outlines the inclusion or exclusion of each instrument and its relevance to the research questions explored in this study.

Table. Instruments Used and Their Relevance to the Research Questions.

Instrument	Used/Not Used	Relevance to Research Questions
Rosenberg Self-Esteem Scale (RSES)	Used	This 10-item scale was used to assess students' self-esteem (Hagborg, 1993; Lani & Rosenberg, 2010), directly addressing Research Question 1 , which examines the self-system of motivational development and its influence on academic performance.
Student Engagement Scale (SES)	Used	The 23-item Student Engagement Scale was used to measure cognitive, emotional, and behavioral engagement (Evans & Zhu, 2023; Koçak & Göksu, 2023; S. Li et al., 2023), which is crucial to Research Questions 2 and 3 . Engagement is studied as a moderator between self-esteem and academic performance, as well as influencing students' perceptions of the learning environment.
Academic Performance (GPA)	Used	Self-reported GPA was used to measure academic success, serving as the outcome variable in Research Questions 1 and 2 .
Psychological Sense of School Membership (PSSM)	Not Used	Although this scale measures a sense of belonging in a traditional face-to-face school environment (Kuttner, 2023; Subedi, 2022; Widiasmara et al., 2023), it was excluded as the focus here is on distance education, where face-to-face interaction is minimal. The variables related to self-esteem, engagement, and academic performance are more central to understanding outcomes in this context.
Help-Seeking Behavior Scale	Not Used	While this scale can offer insights into students' help-seeking tendencies (Halabi et al., 2024; Hu, 2023; Kuang & Wang, 2024), it was not included because the research questions specifically target how self-esteem and engagement affect academic outcomes, rather than help-seeking behaviours, which were considered peripheral to the study's main focus on motivational development.
Learning Climate Questionnaire (LCQ)	Used	This 6-item scale was used to explore students' perceptions of the learning climate and autonomy support (Black & Deci, 2000), which is central to Research Question 3 , where student engagement and its influence on perceptions of the learning environment are examined.

2.4. Data Analysis Techniques

The data was analyzed using SPSS to address the three core research questions and evaluate the relationships between self-esteem, student engagement, and academic performance. The following statistical tests were conducted:

1. **Descriptive Statistics:** These were performed to summarize demographic characteristics such as gender, length of study, and regional background, along with the key variables of self-esteem, student engagement, and academic performance. This provided a general overview of the sample and helped identify notable trends in the data, particularly relevant to **Research Question 1**, which seeks to understand how the self-system of motivational development influences academic performance across different demographic groups.
2. **ANOVA (Analysis of Variance):** To answer **Research Question 1**, ANOVA was conducted to examine how self-esteem (as a component of the self-system of motivational development) influences academic performance while accounting for variations in gender, length of study, and regional background. This test allowed for comparing academic outcomes across these demographic subgroups and highlighted any significant differences based on these factors.
3. **Multiple Regression and Moderation Analysis:** In line with **Research Question 2**, multiple regression analysis was used to determine the direct relationship between self-esteem and academic performance. Moderation analysis was then conducted to explore whether student engagement moderates this relationship, providing insights into how engagement intensifies or weakens the impact of self-esteem on academic success in a distance learning context.
4. **Correlation and Regression Analysis for Learning Climate Perceptions:** To address **Research Question 3**, correlation and regression analyses were performed to examine how student engagement influences students' perceptions of the learning environment (measured using the Learning Climate Questionnaire). This analysis also explored how these perceptions, shaped by engagement, impact academic-related behaviors and performance at Universitas Terbuka.
5. **Reliability Tests:** Cronbach's alpha was calculated to assess the internal consistency of the instruments used in this study, particularly the Rosenberg Self-Esteem Scale, Student Engagement Scale, and the Learning Climate Questionnaire. This ensured the reliability of the scales in measuring self-esteem, engagement, and learning climate perceptions.

3. Results and Discussion

This section presents the findings from the statistical analyses conducted to answer the three core research questions related to self-esteem, student engagement, and academic performance among Universitas Terbuka students. The analyses were carried out using SPSS and include descriptive statistics, ANOVA, multiple regression, moderation analysis, and correlation analysis. Additionally, reliability tests were conducted to ensure the validity of the scales used in the study.

3.1. Descriptive Statistics

Descriptive statistics were used to provide an overview of the sample's demographics and the main variables: self-esteem, student engagement, and academic performance. The participants were diverse in terms of gender, length of study, and regional background.

Table 2. Descriptive Statistics of Main Variables.

Scale	Number of Items	N	Mean (Range)	Std. Deviation (Range)
Rosenberg's Self-Esteem Scale	10	1478	1.01 to 1.70	0.110 to 0.495
Psychological Sense of School Membership	18	1434	2.36 to 3.92	0.569 to 1.107
Student Engagement Scale	23	1366	2.70 to 3.93	0.245 to 0.870
Help-Seeking Behavior Scale	13	1331	2.31 to 3.91	0.415 to 1.017
Learning Climate Questionnaire	6	1403	3.37 to 3.73	0.747 to 0.799
Academic Performance (GPA)	1 (self-reported)	1479	3.1	0.450

The descriptive statistics show that most students reported moderate to high levels of self-esteem and engagement, with an average GPA of 3.1. The student body displayed notable diversity

in terms of regional background, gender, and length of study, providing a broad context for investigating the research questions.

3.2. Research Question 1: Self-System of Motivational Development and Academic Performance

The first research question focused on how the self-system of motivational development, particularly self-esteem, influenced academic performance while accounting for variations in gender, length of study, and regional background. To examine these effects, an ANOVA was conducted.

Table 3. ANOVA Results for Self-Esteem and Academic Performance by Demographic Variables.

Variable	Sum of Squares	df	Mean Square	F-value	p-value
Gender	3.82	1	1.91	4.27	0.038
Length of Study	6.45	2	3.22	5.15	0.009
Regional Background	4.78	3	1.59	3.89	0.021

The ANOVA results revealed significant differences in academic performance based on gender ($p = 0.038$), length of study ($p = 0.009$), and regional background ($p = 0.021$). Students studying for over three years reported higher academic performance, and differences were also observed across gender and regional background. These findings suggest that academic experience and cultural contexts shape performance, consistent with the self-system of motivational development framework.

This supports Kasyoka's (2023) conclusion that self-esteem alone does not guarantee better academic outcomes, implying it interacts with other factors to influence success. The association between length of study and higher performance reflects how students in distance learning develop better strategies over time, aligning with Neroni et al. (2022) and Saeed et al. (2023). The regional differences suggest that cultural and resource availability factors impact students' experiences, underscoring the need for further research on local contexts in distance learning (Ojeleye et al., 2023). This study highlights how psychological, demographic, and cultural factors interact to shape academic performance in distance learning, emphasizing the need for further exploration of these dynamics.

3.3. Research Question 2: Moderating Role of Student Engagement

The second research question explored how student engagement moderated the relationship between self-esteem and academic performance in the context of distance learning at Universitas Terbuka. To investigate this, a multiple regression and moderation analysis were conducted.

Table 4. Multiple Regression and Moderation Analysis.

Predictor	B	SE B	β	t-value	p-value
Self-Esteem	0.28	0.05	0.35	5.23	< 0.001
Student Engagement	0.32	0.04	0.42	6.11	< 0.001
Self-Esteem*Student Engagement (Interaction)	0.19	0.06	0.22	3.22	0.001

The regression results revealed that both self-esteem ($\beta = 0.35$, $p < 0.001$) and student engagement ($\beta = 0.42$, $p < 0.001$) were significant predictors of academic performance. Furthermore, the interaction between self-esteem and student engagement was statistically significant ($p = 0.001$), indicating that student engagement moderates the relationship between self-esteem and academic performance. This suggests that students with higher levels of engagement experience a stronger positive effect of self-esteem on their academic outcomes.

These findings are consistent with existing literature, which underscores the key role of student engagement in improving academic outcomes, especially in online learning environments. Studies by Ismail et al. (2023) and Ong & Quek (2023) show that students who actively participate in their studies, particularly in open distance learning (ODL) settings, tend to perform better academically, as engagement fosters greater emotional and cognitive investment in learning.

Additionally, the results highlight that student engagement acts as a moderator, not only directly affecting academic success but also enhancing the positive effects of self-esteem on academic performance. This supports Skinner (2023) and Sun & Shi (2024), who emphasize the importance of engagement in strengthening the relationship between psychological factors and academic outcomes in self-regulated environments like distance education.

The moderation effect indicates that highly engaged students are better able to translate self-esteem into academic success, echoing Saeed et al. (2023), who argued that self-esteem's impact is heightened when paired with proactive engagement. Without strong engagement, high self-esteem alone may not lead to significant academic gains.

However, challenges remain in fostering engagement at Universitas Terbuka, where students' geographic dispersion and limited face-to-face interaction make this difficult. While ICT integration could help boost engagement, the lack of a standardized instrument to measure ICT proficiency limits our understanding of how it may affect the relationship between self-esteem, engagement, and academic performance.

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3.4. Research Question 3: Family Systems and Academic Performance

The third research question examined how student engagement influences students' perceptions of the learning environment (learning climate) and the role this plays in shaping academic-related behaviors and perceptions at Universitas Terbuka. An independent samples t-test was conducted to analyze the differences in student engagement and academic performance across various perceptions of the learning climate.

Table 5. Independent Samples t-test for Learning Climate Perceptions and Academic Outcomes.

Variable	Learning Climate Perception	N	Mean	Std. Deviation	t-value	p-value
Self-Esteem	Positive	642	1.56	0.18	2.89	0.004
	Negative	831	1.49	0.20	-	-
Student Engagement	Positive	642	3.72	0.31	3.47	0.001
	Negative	831	3.61	0.35	-	-
Academic Performance	Positive	642	3.42	0.29	2.78	0.006
	Negative	831	3.30	0.33	-	-

The t-test results revealed significant differences between students with positive and negative perceptions of the learning environment in terms of self-esteem ($p = 0.004$), student engagement ($p = 0.001$), and academic performance ($p = 0.006$). Students who perceived their learning environment positively reported higher self-esteem, greater engagement in their academic work, and better academic performance compared to those with negative perceptions. This finding highlights the influence of students' perceptions of the learning climate on their psychological and academic outcomes.

The study emphasizes the critical role of student engagement and perceptions of the learning environment in shaping academic outcomes at Universitas Terbuka. Significant differences in self-esteem, engagement, and academic performance based on perceptions of the learning climate highlight the need for supportive online learning environments. Research supports the strong link between emotional and cognitive engagement and academic performance in distance education (Ismail et al., 2023; Ong & Quek, 2023). This study further reveals that higher engagement enhances both academic success and self-esteem, aligning with findings from Skinner (2023) and Sun & Shi (2024) that engagement amplifies the positive effects of self-esteem.

Moreover, students' perceptions of their learning environment significantly influence their engagement and performance, stressing the importance of creating positive, interactive

environments in distance learning (Cojocariu & Mares, 2022; Inegbedion, 2024). The lack of a standardized ICT proficiency instrument at Universitas Terbuka limited a deeper analysis of this factor, although the varying ICT proficiency likely affected engagement levels.

3.5. Reliability and Validity of Instruments

Finally, reliability tests were conducted for the key instruments used in the study. Cronbach's alpha was used to assess the internal consistency of each scale.

Table 6. Reliability of Scales.

Scale	Cronbach's Alpha
Rosenberg's Self-Esteem Scale	0.82
Student Engagement Scale	0.88
Psychological Sense of School Membership	0.79
Learning Climate Questionnaire	0.81

All scales demonstrated good internal consistency, with Cronbach's alpha values above the acceptable threshold of 0.70, confirming that the scales used in this study were reliable.

Overall, the findings from this study highlight several key factors influencing academic performance at Universitas Terbuka, particularly in the context of distance learning. Academic performance was found to vary significantly based on demographic variables such as gender, length of study, and regional background, suggesting that these factors play an essential role in shaping student outcomes. Furthermore, student engagement emerged as a critical moderator in the relationship between self-esteem and academic performance, with higher levels of engagement amplifying the positive effects of self-esteem on academic success. This underscores the importance of fostering an engaging learning environment to enhance academic outcomes, especially in distance education settings where face-to-face interactions are limited. Although this study did not directly assess ICT proficiency due to the lack of standardized instruments at Universitas Terbuka, the results emphasize the need for future research to explore the role of ICT in supporting student engagement and performance.

4. Conclusion

This study provides valuable insights into the complex relationships between self-esteem, student engagement, and academic performance among students at Universitas Terbuka. It demonstrates that demographic factors such as gender, length of study, and regional background significantly influence academic outcomes, with student engagement playing a critical moderating role by amplifying the positive effects of self-esteem on academic success in a distance learning environment. Additionally, the study highlights the need for culturally responsive educational strategies, given that students from matrilineal backgrounds reported higher levels of self-esteem, engagement, and academic performance. These findings emphasize the importance of fostering student engagement to improve academic outcomes in online learning settings.

Limitations, Implications, and Future Research

While this study enhances our understanding of self-esteem, student engagement, and academic performance, several limitations should be noted. The cross-sectional design restricts causal interpretations, and future research could adopt longitudinal approaches to track these variables over time. Additionally, the reliance on self-reported data may introduce biases, such as social desirability or inaccurate self-assessment. Future studies could benefit from more objective measures, like academic records or instructor evaluations.

Another limitation is the absence of a standardized instrument at Universitas Terbuka to measure students' proficiency in Information and Communication Technology (ICT), which may affect engagement and academic performance in online settings. Once appropriate tools are available, future research should explore this. The study's analysis of family systems was also limited to self-

reported backgrounds, without deeper cultural or socioeconomic context. Qualitative methods could offer more nuanced insights.

Finally, the digital divide was not fully addressed, which may have affected student engagement, especially among geographically dispersed students. Despite these limitations, the study provides a valuable foundation for understanding how self-esteem and engagement influence academic success in distance learning.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org. This article includes supplementary material related to the research instruments used in the study, available at <https://sl.ut.ac.id/Instrument-RKI-2024>.

Funding: This article is derived from research funded by Universitas Terbuka, as outlined in the research implementation contract Number B/869/UN31.LPPM/PT.01.03/2024, signed by the Head of the Institute for Research and Community Service, Universitas Terbuka, on February 17, 2024. The authors did not receive support from any other organization for the submitted work.

Data Availability Statement: Data, including the list of instruments used in this study (currently available in Bahasa Indonesia), will be made available upon request from the first author.

Conflicts of Interest: The authors declare that there are no competing interests relevant to this article's content.

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