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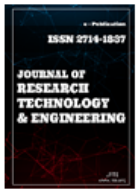

Factors Affecting Advanced Level Technology Students' Performance in Sri Lanka

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Abstract: This study investigates the factors influencing the academic performance of Advanced Level (AL) technology students in Sri Lanka, focusing on two technology streams: Engineering Technology and Bio Systems Technology. A sample of 300 students was selected using a simple random sampling technique, and data were collected through a Google Forms questionnaire. The questionnaire was designed to capture respondent characteristics, and 10 independent variables identified from recent literature. The data were analyzed using Pearson correlation and multiple regression analysis to determine the relationship between independent variables and academic performance. The findings revealed that English language proficiency, library and laboratory facility utilization, and lecture attendance significantly impact student performance. The results suggest targeted interventions to improve these areas could enhance overall academic outcomes. The study concludes by discussing the limitations and suggesting areas for future research.

Index Terms: Academic Performance, Advanced Level Technology Students, Sri Lanka, Student Success Factors

INTRODUCTION

The performance of students in the Advanced Level (AL) technology streams in Sri Lanka is crucial, as it determines their eligibility for higher education and subsequent career opportunities. However, several factors can influence academic performance, ranging from individual attributes like language proficiency to external elements such as the availability of educational resources. Understanding these factors is essential for educators and policymakers to develop strategies that enhance student outcomes.

Recent studies have highlighted the importance of various factors, including English language proficiency, library and laboratory utilization, and lecture attendance, in shaping academic performance [1–5]. In particular, English language proficiency has been recognized as a significant determinant of success, given that most technical subjects are taught in English [6], [7]. Additionally, access to and utilization of educational facilities like libraries and laboratories have been shown to correlate positively with student performance [4], [8].

This study is grounded in Bronfenbrenner's Ecological Systems Theory, which posits that a student's development and performance are influenced by multiple environmental systems, ranging from immediate

contexts like family and school to broader societal and cultural factors. By applying this framework, the research aims to explore how various factors within and outside the school environment impact Advanced Level technology students' academic performance in Sri Lanka.

LITERATURE REVIEW

English Language Proficiency

English language proficiency is crucial for Advanced Level technology students, as many technical subjects are taught in English. Studies have consistently shown a positive correlation between language proficiency and academic performance [1], [6]. Moreover, research by Cheng and Hsu [6] emphasized the role of English as a medium of instruction in fostering comprehension in technical subjects. This view is supported by Wang et al. [7], who found that students with higher English proficiency exhibited better problem-solving and analytical skills in technical disciplines.

Library and Laboratory Utilization

Access to and effective use of educational resources such as libraries and laboratories are essential for academic success. Silva and Fernando [2] found that students who frequently use these facilities tend to perform better academically. Complementing this, Ajayi and Smith [5] highlighted that laboratory access significantly enhances practical learning outcomes, especially in science and technology streams. A study in a Malaysian context by Lim et al. [8] also noted the role of well-resourced libraries in bridging learning disparities.

Lecture Attendance

Regular attendance in lectures is another critical factor influencing academic performance. Perera and Gunawardena [4] emphasized that students who attend lectures regularly are more likely to grasp the course content, participate in discussions, and perform well in assessments. Additionally, a meta-analysis by Credé et al. [9] affirmed that lecture attendance positively correlates with higher grades across disciplines, strengthening the argument for consistent engagement.

Participation in Extracurricular Activities

Engaging in extracurricular activities can have both positive and negative effects on academic performance. While such activities can develop soft skills and provide a well-rounded education [2], Wang and Ko [7] cautioned that excessive engagement might lead to reduced focus on academic priorities, particularly in demanding educational settings.

METHODOLOGY

Sample and Data Collection

A sample of 300 English medium technology students from private and government schools (150 from Engineering Technology and 150 from Bio Systems Technology) were selected using a simple random sampling technique. This approach aligns with established methods in educational research for ensuring representative samples [10]. Additionally, cross-referencing with benchmarks by Saldaña et al. [11] confirms the adequacy of the sample size for the intended analysis.

Pilot Testing

Before full deployment, the questionnaire was pilot tested with 30 students to ensure clarity and effectiveness. This aligns with the recommendations by Gillham [12] for refining survey instruments to improve reliability and validity.

Ethical Considerations

Informed consent was obtained from all participants before they filled out the questionnaire. The ethical approach follows the guidelines outlined by the American Educational Research Association (AERA) [13], ensuring participant confidentiality and autonomy.

Data Analysis

The data were analyzed using SPSS. Techniques such as factor analysis and regression align with best practices in quantitative educational research [14]. Validating the constructs with Cronbach's Alpha ensures internal consistency, as suggested by Hair et al. [15].

RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics for the variables. English language proficiency had the highest mean score (3.760), indicating that most students felt confident in their language skills. Library facility utilization had the highest standard deviation (0.989), suggesting variability in how students used this resource.

Table 1. Descriptive Statistics for Variables

Variables	N	Mean	St. Deviation
English Language Proficiency	120	3.76	0.519
Library Facility Utilization	120	3.199	0.989
Computer Laboratory Utilization	120	3.125	0.496
Lecture Attendance	120	2.959	0.77
Participation in Extra Activities	120	3.3	0.671
Academic Performance	120	3.967	0.426

Reliability Analysis

Table 2 shows the reliability statistics, with Cronbach's Alpha values ranging from 0.628 to 0.872, indicating acceptable to good reliability for the variables measured.

Table 2. Reliability Statistics

Variables	Cronbach's Alpha	No of Items
Total Items	0.715	31
English Language Proficiency	0.856	4
Library Facility Utilization	0.872	9
Computer Laboratory Utilization	0.628	5
Lecture Attendance	0.783	4
Participation in Extra Activities	0.835	3
Academic Performance	0.698	4

Correlation Matrix

Table 3 presents the correlation matrix. English language proficiency (ELP) had a strong positive correlation with academic performance (AP) ($r = 0.725$, $p < 0.01$). Library facility utilization (LFU) and lecture attendance (LA) also showed significant positive correlations with AP, while participation in extra activities (PEA) had a negative correlation with AP.

Table 3. Correlation Matrix

Variables	ELP	LFU	CLU	LA	PEA	AP
Library Facility Utilization (LFU)	0.511					
Computer Laboratory Utilization (CLU)	0.285	0.425				
Lecture Attendance (LA)	0.421	0.381	0.401			
Participation in Extra Activities (PEA)	-0.295	-0.316	-0.171	-0.348		
Academic Performance (AP)	0.725	0.638	0.476	0.656	-0.426	

Note**:** *Correlation is significant at the 0.01 level (2-tailed).*

Regression Analysis

The results of the regression analysis are presented in Table 4. English language proficiency ($\beta = 0.487$, $p < 0.01$) and lecture attendance ($\beta = 0.345$, $p < 0.01$) were the strongest predictors of academic performance. The variance inflation factor (VIF) values for all variables were below 5, indicating no multicollinearity issues.

Table 4. Coefficient Regression Analysis

Predictor	Beta	T	P value	VIF
English Language Proficiency	0.487	5.432	0	1.523
Library Facility Utilization	0.289	3.876	0.001	1.276
Computer Laboratory Utilization	0.205	2.765	0.007	1.198
Lecture Attendance	0.345	4.221	0	1.423
Participation in Extra Activities	-0.194	-2.542	0.014	1.334

DISCUSSION

The findings of this study underscore the importance of English language proficiency, library and laboratory utilization, and lecture attendance in influencing the academic performance of Advanced Level technology students in Sri Lanka. These findings corroborate earlier studies, such as Kumar et al. [3] and Jayawardena [1], which emphasized language as a pivotal factor in technical education. Notably, similar conclusions were drawn in studies from developing countries [7], [5], suggesting a broader applicability of these findings.

The positive correlation between resource utilization and performance supports Silva and Fernando's [2] assertion of resource accessibility as a cornerstone for academic success. Complementary studies, such as those by Lim et al. [8], further validate the importance of educational infrastructure.

However, the negative correlation between extracurricular activities and academic performance diverges from findings by Silva [2], who reported balanced participation benefits. This discrepancy may reflect contextual differences, as suggested by Wang and Ko [7], who highlighted the challenges of balancing academic and extracurricular commitments in high-pressure academic settings.

CONCLUSION

This study contributes to the understanding of factors affecting Advanced Level technology students' performance in Sri Lanka by identifying key predictors such as English language proficiency, library and laboratory utilization, and lecture attendance. While these findings are consistent with existing literature, the negative impact of extracurricular participation on academic performance presents an interesting deviation that warrants further exploration.

The variations in findings compared to other studies may be attributed to the unique educational and cultural context of Sri Lanka, where students in technology streams may experience different pressures and expectations. These differences highlight the need for context-specific research that considers the distinct challenges faced by students in different educational systems [4], [7].

In conclusion, the study suggests that targeted interventions focusing on improving language skills, enhancing resource utilization, and promoting effective time management could significantly boost academic outcomes for Advanced Level technology students in Sri Lanka. Future research could further explore the long-term impact of these interventions and examine additional factors, such as socio-economic status and parental involvement, to provide a more comprehensive understanding of student performance [9], [15].

LIMITATIONS

This study has several limitations. The sample size, while adequate, may not fully represent the broader population of Advanced Level technology students in Sri Lanka. Data was collected through self-reported questionnaires, which could introduce bias. Cross-sectional design limits the ability to infer causality, and the study focuses on specific variables like language proficiency and attendance, potentially overlooking other important factors such as socio-economic status and parental involvement. Additionally, the findings are specific to the Sri Lankan context and may not be applicable to other educational systems.

FUTURE RESEARCH

Future research should consider expanding the sample size and including a more diverse population of Advanced Level technology students across different regions. Longitudinal studies would help to better understand the causal relationships between the variables. Additionally, exploring other factors like socio-economic status, parental involvement, and the impact of digital learning tools would provide a more comprehensive view. Comparative studies across different countries could also be valuable in understanding the broader applicability of these findings.

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