



STUDY HABITS, ATTENDANCE, AND SOCIO-DEMOGRAPHIC FACTORS AS PREDICTORS OF ACADEMIC PERFORMANCE AMONG STUDENTS

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RESEARCH ARTICLE



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Abstract

Using a publicly accessible secondary dataset, this study investigates the association between academic achievement, study habits, attendance, sleep, and sociodemographic background among a sample of 1,000 students. The study's hypotheses were tested using descriptive statistics, Pearson correlation, multiple linear regression, independent-samples t-tests, one-way ANOVA, and chi-square testing. The greatest predictor of final exam grades, according to the results, was daily study time ($\beta = 4.13$, $p < .001$), followed by internet access, prior academic grade, attendance, and sleep length. Part-time workers scored substantially lower than non-part-timers ($t = 4.56$, $p < .001$, $d = 0.32$), but there was no statistically significant correlation between performance and parental education level, gender, or involvement in extracurricular activities. About 66.5% of the variance in final test scores was explained by the total regression model ($R^2 = .665$, $F(9, 888) = 195.99$, $p < .001$). The results corroborate the behavioural investment viewpoint in educational sociology, which holds that the main factors influencing academic achievement in this group are time and resource allocation rather than a fixed demographic background. The constraints of secondary data analysis and implications for study skills interventions are examined.

Keywords: *academic performance, study habits, attendance, secondary data analysis, educational sociology*

Introduction

Since academic performance is frequently used as a stand-in for the development of human capital, social mobility, and institutional effectiveness, it continues to be one of the most researched outcomes in educational and social science studies. A large body of research contends that behavioural and contextual factors, such as study time, class attendance, sleep, and family background, have an independent and frequently modifiable impact on student outcomes, even though intelligence and prior ability are significant determinants of achievement. From a social science standpoint, academic performance can be viewed through the prism of resource allocation theory, which holds that people's distribution of limited time and effort among conflicting demands (study, work, leisure, rest) shapes outcomes. This framing presents study habits as a socially patterned behaviour that is impacted by resources like internet connectivity, family educational capital, and the need for part-time work, rather than just a psychological characteristic. This study examines how study time, attendance, sleep, and sociodemographic traits collectively predict final test achievement using a publicly accessible secondary dataset (derived from Kaggle) encompassing 1,000 students.

The following research questions and hypotheses serve as the study's compass:

RQ1: Do study time and class attendance significantly predict final examination scores?

RQ2: Do socio-demographic and contextual factors (gender, parental education, internet access, part-time employment, extracurricular participation) significantly affect academic performance?

H1: Study time is positively associated with final exam score.

H2: Attendance percentage is positively associated with final exam score.

H3: Students with a part-time job score significantly lower than those without.

H4: Parental education level is positively associated with final exam score.

Literature Review

Most kids didn't study outside of the classroom. Pupils were reluctant to attend courses, erratic, and usually late. Not many students took notes, reread them, or brought notebooks or pens. In general, neither gender participated much in class or asked questions. Students' overall performance was subpar, and many turned to plagiarism, cheating, and assignment copying. Most of them studied haphazardly and in an unorganised manner, without adhering to lecture revision timetables (Mahmoud Ahmad, 2018). By providing a thorough statistical analysis of how academic engagement, as measured by lecture attendance, reading time, and resource utilisation, directly affects student success in higher education, this study closes a gap in the literature. For more than 73% of students, the optimal range of study hours was found to be two to three hours. After this range, diminishing returns kick in, and any more study time will have very little effect on learning and understanding. It is crucial for educators to teach students how to choose their own threshold of optimality and stick to it when studying in order to prevent burnout, exhaustion, or waning focus (Allen Otunomeruke & E. Omosioni, 2025). The number of absences from class and grades were found to be negatively correlated. However, because most of the research, including theirs, lacked matched experimental and control groups, their association was weak, suggesting that other factors were at play. Therefore, it is impossible to determine whether better students attend classes more frequently or whether regular attendance led to slightly higher ratings. At the end of the second year, there was a strong association ($r = 0.203$, $P < 0.05$) between the students' grade averages and attendance. As attendance rose, they discovered higher grade averages. Students can believe that distance learning and self-directed study are the same as in-class activities (Panta, 2017). This study analysed students' final course grades in mandatory mathematics courses to determine whether there was a connection between academic achievement and class attendance. According to the findings, students who miss a lot of class likely to have lower final course averages. It is important to remember that secondary factors other than attendance have an impact on a student's grade (Schmidt & Raines, 2019). Focus group discussions (FGD), interviews, and a quantitative survey were all combined in this sequential explanatory mixed method study. In senior high school, 63% of students studied accounting, whilst 32% had no prior experience. 19.67% learned from seminars or training, 29.33% from literature, and 31.33% from family members. Just 7% were employed in accounting. Prior knowledge may not be a failure factor, according to the study's findings. Students cited this as their biggest obstacle (51.67%), followed by trouble understanding terminologies (46%) and memorising rules/concepts (48.33%). Other important factors included class size (36.33%), lack of study time (32%), and juggling employment, school, and family (30.67%) (Velasco, 2019). Learning styles were taken into consideration for this study. believes that in order for students to be successful in their studies, they need to be able to properly absorb the material, process it, think about it, and express it both orally and in writing. Students that have good study habits are more able to reflect critically on skills outcomes including choosing, analysing, critiquing, and synthesising. A student's capacity to form effective study habits is crucial. Many students think that studying is the most important thing they can do. Students can spend hours studying, but they won't learn anything (Ishii, 2017).

Researchers have attempted to characterise absenteeism in numerous ways. The kids' cultural context affects the definition. According to some experts, pupils who miss two or more days of school are deemed habitual absentees and typically receive low grades. Three categories were created for the students: bad attendance (69% and lower), acceptable attendance (70-84%), and good attendance (85-100%). 73.55% of students in English Language Course 1 (ELC 1) and 69.68% of students in ELC 2 had low attendance (Ancheta et al., 2021). The study discovered statistically significant differences ($p < .05$) between first-generation and non-first-generation pupils as well as between males and women. In terms of hours spent and course material covered, women reported studying nearly twice as much as males. Compared to non-first-generation students, first-generation students experienced academic difficulties in nearly every aspect. Class attendance, employment hours, academic self-efficacy scores, and current grade point average were found to be statistically significant ($p < .05$) predictors of participants' course grade using multiple linear regression analysis (Sund & Bignoux, 2018). The purpose of the current study was to evaluate academic performance and study habits among fourth-year BSc nursing students. According to the survey's findings, pupils with strong study habits can achieve academic success. As an eye-opener, the researcher carried out this study to implement certain interventions to enhance the students' positive study habits in order to produce outstanding outcomes. Of the thirty pupils, twenty (66.67%) had first class, four (13.33%) had second class, and six (20%) had academic performance of distinction (Princy et al., 2023). The correlation between academic achievement and attendance in two minor parts of a Principles of Finance course ($n = 71$). They discover that attendance has a favourable impact on performance after adjusting for the selectivity bias caused by student withdrawals using Tobit and Heckman's two-stage models. In all models, attendance had a slight but statistically significant beneficial impact on performance, raising test scores by roughly 0.13 percentage points for each additional percentage point of lectures attended (Capuno et al., 2019).

Based on their significance to the current investigation, the factors addressed below were selected. among the first writers to investigate the connection between test scores and student attendance. Over the past 15 years, a number of variables have contributed to a global decline in class attendance. The main excuses offered by students for missing class are employment obligations, poor lecture delivery, assessment constraints, and lecture time. Students now have to look for part-time jobs in addition to their studies. A significant contributing factor, accounting for 26.5% of the factors found, was inadequate lesson planning and delivery by instructors (Prasetyo et al., 2019). The performance of business education students is significantly impacted by class attendance, with a probability (Sig. (2-tailed)) of 0.000, which is less than 0.05. Consequently, the null hypothesis was rejected. The academic achievement of business education students is significantly impacted by classroom

participation, with a probability (Sig. (2 – tailed)) of 0.000, or less than 0.05. Consequently, the null hypothesis was refuted (Ibrahim & Abdullahi, 2014).

The techniques and routines that students use to study are referred to as their study habits, and they might be methodical, successful, or unsuccessful. This suggests that while bad study techniques may lead to subpar academic performance, successful study habits are typically linked to higher academic achievement. Additionally, the results show that male and female students had quite different study habits, as shown by the F-ratio, which was statistically significant at the 0.01 level. Gender differences and study habits are independent of two levels of SES, as indicated by the insignificant F-ratio for the interaction effect of gender (Boys and Girls of High SES) of 0.66 (Khan, 2016). Students' study strategies also appear to be situation-specific. When preparing for a big essay exam, for instance, a student is likely to take a deep approach, yet when preparing for a standard multiple-choice exam, the same student may adopt a surface approach. While students from low-context and individualistic cultures typically exhibit superior academic achievement, pupils from high-context and collectivistic cultures are frequently linked to lower academic performance. Low-achieving students sit in the back, don't take notes, miss at least three lectures, stay silent the entire semester, and never search for the professor after class (Cerna & Pavliushchenko, 2015). This demonstrates that students who paid less attention in class will struggle to comprehend the subsequent learning material, which can result in a condition known as feeling overburdened and discouraged about the remaining material in the course. They are also likely to feel disappointed in their studies and have lower academic engagement and success. Academic performance was found to be predicted by academic pressure and focus. Academic achievement was adversely affected by academic pressure (C. Tagud & M. Valle, 2023).

Methodology

Research Design and Data Source: This study adopts a quantitative, cross-sectional, correlational design using secondary data. The dataset was obtained from Kaggle (a publicly available student performance dataset) and comprises 1,000 student-level records with no unit of analysis overlap. As a secondary dataset, no primary data collection, sampling frame, or ethical clearance procedures were required; however, the dataset's provenance and any documented collection methodology should be verified and cited according to Kaggle's dataset documentation before submission

Variables: The dependent variable was `final_exam_score` (continuous, 0–100). Independent variables included: `study_time_hours` (daily average), `attendance_percent`, `sleep_hours`, `previous_grade`, `gender`, `parental_education` (None / High School / Bachelors / Masters / PhD), `internet_access` (Yes/No), `extracurricular_activities` (Yes/No), and `part_time_job` (Yes/No). Parental education had 102 missing values (10.2% of the sample); listwise deletion was applied for models including this variable ($n = 898$), while descriptive and correlation analyses used the full available sample for each variable.

Analytical Techniques: Analyses were conducted in IBM SPSS Statistics and comprised: (1) descriptive statistics for all study variables; (2) Pearson product-moment correlations among continuous variables; (3) an ordinary least squares (OLS) multiple linear regression predicting final exam score from all independent variables simultaneously, with categorical predictors dummy- or ordinal-coded; (4) independent-samples t-tests (with Levene's test for equality of variances, and the equal-variances-not-assumed statistic reported where warranted) comparing mean final exam scores across binary group variables (gender, internet access, extracurricular participation, part-time job), with Cohen's d reported as an effect size; (5) a one-way ANOVA testing mean differences in final exam score across parental education levels; and (6) a chi-square test of independence between part-time job status and letter grade category. An alpha level of .05 was used for all significance tests.

Results

Sample Characteristics

The sample consisted of 1,000 students (51.0% female, $n = 510$; 49.0% male, $n = 490$). Regarding parental education, 35.6% reported a high school education ($n = 356$), 30.8% a Bachelor's degree ($n = 308$), 18.4% a Master's degree ($n = 184$), 5.0% a PhD ($n = 50$), and 10.2% had missing data ($n = 102$). Most students had access to the internet (85.4%, $n = 854$), were involved in extracurricular activities (57.2%, $n = 572$), and worked part-time (31.6%, $n = 316$). The final grades were as follows: A (28.4%), B (35.4%), C (26.1%), D (8.9%), and F (1.2%).

Descriptive Statistics

The continuous research variables are summarised in Table 1. Students reported studying for 3.57 hours a day on average ($SD = 1.48$), with a wide range of 0.50 to 8.10 hours. Although it varied greatly from 54.80% to 100%, the mean class attendance was high at 85.09% ($SD = 9.27$), suggesting that some students attended sporadically. Sleep duration ranged from 3.20 to 10.00 hours per nite, with an average of 6.80 hours ($SD = 1.20$), which is marginally less than the generally advised 7–9 hours for young people. Final test results, which ranged from 46.80 to 100 and averaged 83.54 ($SD = 10.34$), were more variable and somewhat lower than prior academic grades, which averaged 69.74 ($SD = 12.61$). Although the standard deviations show that there is still significant individual variance in the sample, the higher mean and smaller range of final test scores in comparison to prior grades hint to an overall improvement in performance across the two assessment sites.

Variable	M	SD	Min	Max
Study time (hrs/day)	3.57	1.48	0.50	8.10
Attendance (%)	85.09	9.27	54.80	100.00
Sleep (hrs/night)	6.80	1.20	3.20	10.00
Previous grade	69.74	12.61	31.30	100.00
Final exam score	83.54	10.34	46.80	100.00

Table 1. Descriptive statistics for continuous study variables (N = 1,000).

Correlation Analysis

Pearson correlations between the continuous research variables are shown in Table 2. Study time ($r = .568$, $p < .001$), prior grade ($r = .406$, $p < .001$), attendance ($r = .262$, $p < .001$), and sleep hours ($r = .148$, $p < .001$) all had a substantial and positive correlation with the final exam result. Attendance, sleep, and prior grade did not substantially correlate with study time (all $p > .16$), indicating that these behavioural factors add relatively separate information to the model rather than representing a single underlying "diligence" element.

Variable	1	2	3	4	5
1. Study time	—	-.04	.01	-.04	.568**
2. Attendance		—	-.02	.02	.262**
3. Sleep hours			—	-.01	.148**
4. Previous grade				—	.406**
5. Final exam score					—

*Table 2. Pearson correlation matrix. ** $p < .001$.*

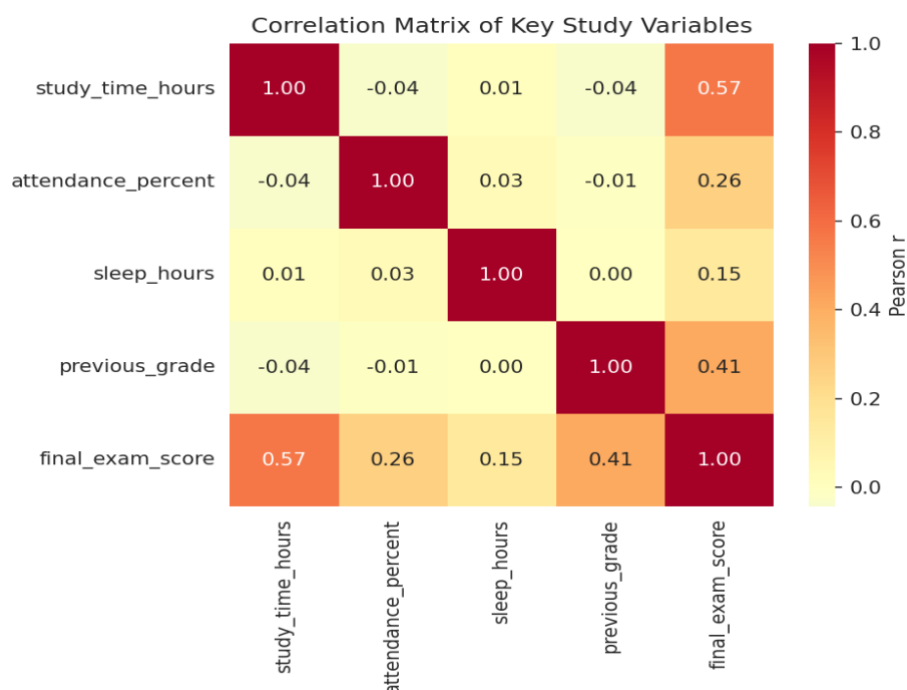


Figure 1. Heatmap of Pearson correlations among continuous study variables.

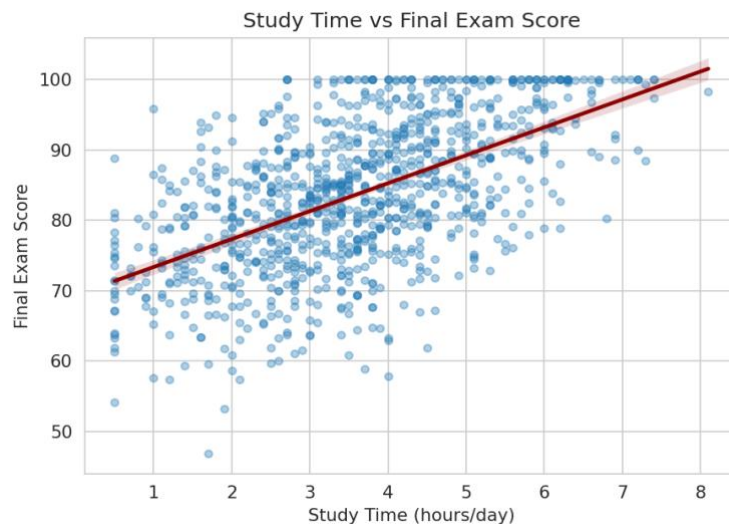


Figure 2. Scatterplot of daily study time and final exam score, with fitted regression line.

Multiple Regression Analysis

To predict the final test result from all study variables at once, a multiple linear regression was used ($n = 898$, listwise deletion on parental education). A large amount of the variance in final exam results was explained by the overall model, which was statistically significant ($R^2 = .665$, adjusted $R^2 = .662$, $F(9, 888) = 195.99$, $p < .001$). As shown in Table 3, study time was the strongest positive predictor ($b = 4.13$, $p < .001$), followed by internet access ($b = 5.50$, $p < .001$), previous grade ($b = 0.358$, $p < .001$), attendance ($b = 0.328$, $p < .001$), and sleep hours ($b = 1.12$, $p < .001$). When all other factors were held constant, part-time employment status was a significant negative predictor ($b = -3.43$, $p < .001$), meaning that working students' average scores were about 3.4 points lower. Extracurricular participation approached but did not reach conventional significance ($b = 0.78$, $p = .055$). Gender ($p = .965$) and parental education level ($p = .434$) were not significant predictors once behavioural and contextual variables were controlled for.

Predictor	b	SE	t	p
Intercept	4.038	2.588	1.560	.119
Study time (hrs)	4.129	0.137	30.121	< .001
Attendance (%)	0.328	0.022	15.231	< .001
Sleep hours	1.122	0.165	6.782	< .001
Previous grade	0.358	0.016	22.346	< .001
Gender (male = 1)	-0.018	0.403	-0.043	.965
Internet access (yes = 1)	5.500	0.575	9.561	< .001
Extracurricular (yes = 1)	0.781	0.407	1.918	.055
Part-time job (yes = 1)	-3.432	0.434	-7.917	< .001
Parental education (ordinal)	0.174	0.223	0.782	.434

Table 3. OLS multiple regression predicting final exam score ($N = 898$). $R^2 = .665$, Adj. $R^2 = .662$, $F(9, 888) = 195.99$, $p < .001$.

Group Comparisons

Male and female students' final exam scores did not significantly differ, according to independent-samples t-tests (Table 4) ($t = -0.20$, $p = .844$, $d = -0.01$) or between students who did and did not participate in extracurricular activities ($t = 0.69$, $p = .488$, $d = 0.04$). However, students with internet access scored significantly higher than those without ($t = 5.22$, $p < .001$, $d = 0.49$, a

medium effect), and students without a part-time job scored significantly higher than those with one ($t = 4.56$, $p < .001$, $d = 0.32$, a small-to-medium effect).

Comparison	Group 1 M (n)	Group 2 M (n)	t	p	Cohen's d
Gender (M vs F)	83.48 (490)	83.61 (510)	-0.20	.844	-0.01
Internet access (Yes vs No)	84.28 (854)	79.44 (146)	5.22	< .001	0.49
Extracurricular (Yes vs No)	83.74 (572)	83.28 (428)	0.69	.488	0.04
Part-time job (No vs Yes)	84.58 (684)	81.35 (316)	4.56	< .001	0.32

Table 4. Independent-samples t-test comparisons on final exam score

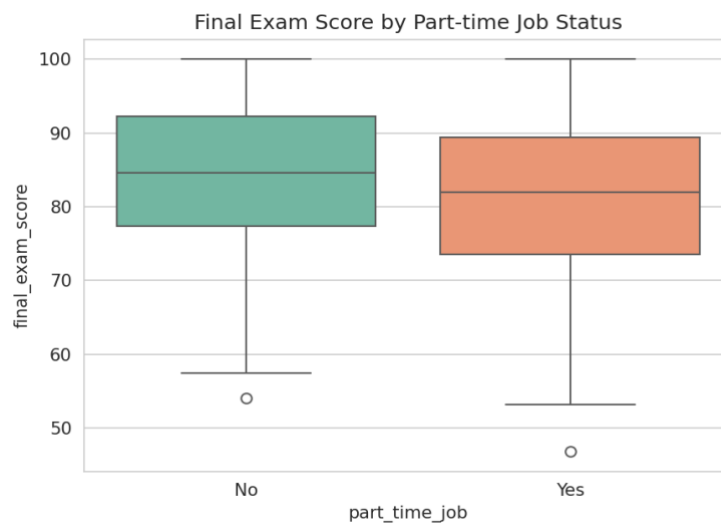


Figure 3. Final exam score distribution by part-time job status.

A one-way ANOVA testing final exam score differences across parental education levels was not statistically significant, $F(3, 894) = 0.62$, $p = .600$, indicating no meaningful mean differences across None/High School/Bachelors/Masters/PhD categories in this sample (means ranged narrowly from 83.23 to 85.06). This runs counter to H4 and is discussed further below.

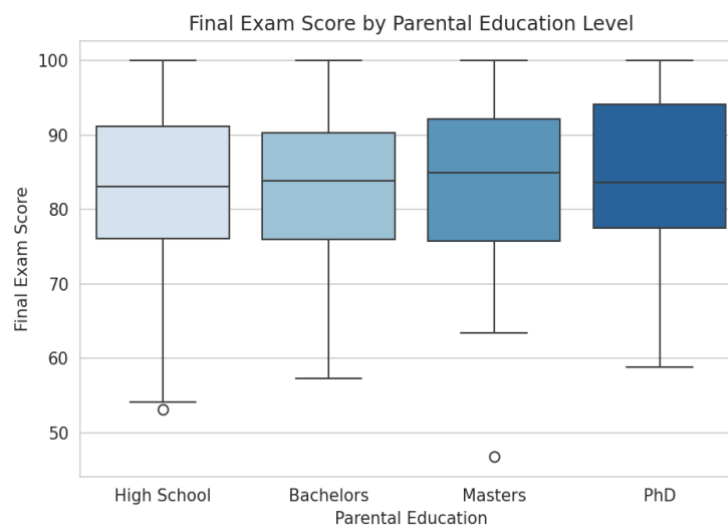


Figure 4. Final exam score by parental education level (non-significant group differences).

The association between part-time employment status and letter grade category (A–F) was assessed using a chi-square test of independence. According to the model and t-test results above, there was a statistically significant difference in the distribution of letter grades between working and non-working students ($\chi^2(4, N = 1000) = 30.37, p < .001$).

Discussion

A behavioural investment interpretation of academic achievement in this population is generally supported by the findings. Both in bivariate correlation and after adjusting for every other variable in the regression model, study time proved to be the most powerful predictor of final test grades, hence supporting H1. Additionally, attendance was a strong independent predictor that supported H2, which is in line with the theory that being present in the classroom promotes both institutional involvement and content exposure.

Even after adjusting for study time and other factors, part-time work was linked to a significant performance penalty, supporting H3. This implies that working students experience performance costs that go beyond what can be accounted for by fewer study hours alone; these costs may be due to weariness, stress, or schedule difficulties that are not specifically included in the dataset.

Parental education level did not significantly correlate with academic performance in either the bivariate ANOVA or the multiple regression, in contrast to H4 and much of the cultural-capital research. This null finding is significant because it implies that behavioural factors like study time, attendance, and sleep may function largely independently of family educational background in this specific sample, or that any indirect effect of parental education is fully mediated through these behavioural variables rather than functioning as a direct structural constraint. In contrast, internet access shown a strong and significant impact, suggesting that, in this situation, digital access is a more direct resource limitation on performance than parental education.

After controlling for behavioural factors, gender and extracurricular involvement did not significantly correlate with performance, indicating that academic outcomes in this group are not strongly influenced by these traits.

Limitations

Several constraints should be considered. First, the cross-sectional, correlational design prevents causal inference; for example, the negative relationship between part-time job and performance could be attributed to reverse causation (weaker students self-selecting into paid work) rather of a direct causal effect. Second, as a secondary Kaggle dataset, the original sampling methodology, population, and measurement procedures are not fully documented and cannot be independently verified; the extent to which the sample is representative of any specific real-world student population is unknown, and results should be interpreted as illustrations of relationships in this dataset rather than generalisable population estimates.

Third, parental education data was missing in 10.2% of cases; if the missingness was not random, listwise deletion might have produced bias. Lastly, a number of potentially significant covariates (such as socioeconomic status, motivation, teaching quality, and mental health) were not included in the dataset and could not be adjusted for.

Conclusion

This study used a secondary dataset and a multi-method quantitative approach to investigate predictors of academic achievement in 1,000 students. Study time, attendance, sleep, prior grades, internet access, and part-time employment status were all strong independent predictors of final exam performance, accounting for around two-thirds of the total variance in results. Gender, extracurricular engagement, and parental education level, on the other hand, revealed no significant association with performance after controlling for behavioural characteristics. These findings imply that interventions aimed at changeable behaviours such as time management, attendance support, and mitigating the academic costs of part-time work may be more actionable levers for enhancing student outcomes than methods based simply on fixed demographic backgrounds. Future research should use longitudinal or experimental methodologies, as well as more complete socioeconomic status indicators, to further understand and establish the causal mechanisms behind these observed relationships.

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