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The Effect of Digital Innovation Utilization and Proper Time Management on Academic Outcomes of Working University Students

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Abstract

This study investigates the influence of digital innovation utilization and time management on the academic performance of university students who work while pursuing their studies. In the era of increasing technology integration in higher education, understanding how these factors contribute to student achievement is crucial, particularly for those balancing academic and professional responsibilities. A quantitative research approach was employed, with data collected through questionnaires distributed to 100 working students from various faculties. The data were analyzed using multiple linear regression to determine the extent to which digital innovation and time management affect academic performance. The results reveal that both factors significantly influence students academic outcomes, with time management showing a slightly stronger impact. Students who can organize their schedules effectively and leverage digital tools efficiently tend to perform better academically compared to those who struggle with these aspects. The findings highlight that effective time management allows students to balance their study and work commitments, reducing stress and enhancing productivity. Meanwhile, the use of digital innovations such as online learning platforms, productivity apps, and digital collaboration tools facilitates more flexible and efficient learning experiences.
In conclusion, this study underscores the need for universities to strengthen digital literacy and time management training as part of their academic support programs for working students. These competencies are essential not only for improving academic performance but also for helping students adapt to the growing demands of a technology driven learning environment and professional life.

Keywords:

Digital Innovation Utilization, Time Management, Working Students

Introduction

The rapid advancement of technology has brought significant changes to the landscape of higher education. Digital innovation now plays a crucial role in supporting the learning process, particularly for university students who work while

studying. For these students, the integration of digital technologies such as online learning platforms and collaborative systems offers flexible and efficient learning opportunities that can be accessed from anywhere, enabling them to study without being constrained by work schedules. Globally, the integration of digital technology in higher education has transformed traditional learning methods into more interactive and flexible systems. In Indonesia, initiatives such as the Merdeka Belajar–Kampus Merdeka policy encourage the use of digital tools to promote independent and remote learning. This transformation demands that students—especially those balancing professional and academic responsibilities—adapt to technology-driven environments to maintain their academic performance.

However, working students often face considerable challenges, including time constraints, fatigue, and difficulty managing overlapping responsibilities between work and study. These issues can lead to reduced motivation, increased stress, and lower academic outcomes if not managed effectively. Therefore, strong time management skills and the effective utilization of digital innovation become essential in helping students maintain productivity and achieve optimal academic success. This study is particularly important because the number of working students in Indonesia continues to increase as they seek to support themselves financially while pursuing higher education. Understanding how digital innovation utilization and time management affect their academic performance is crucial for developing effective strategies that enhance both learning outcomes and student well-being.

Accordingly, this research aims to analyze the influence of digital innovation utilization and time management on the academic performance of students who work while attending university. The findings are expected to contribute not only to the theoretical understanding of how digital technology and time management skills affect learning achievement but also to practical implications for higher education institutions. These results can serve as a foundation for universities to design adaptive learning policies, promote digital literacy programs, and strengthen time management training as part of academic support systems for working students. Thus, this research addresses the challenges of modern higher education by promoting a balance between work and study, fostering flexibility and productivity in the digital era.

Theoretical Framework

In the era of digital transformation, the utilization of technology has become a crucial aspect in supporting student learning. Technologies such as Learning Management Systems (LMS), productivity applications, and online communication platforms facilitate flexible access to course materials, interaction with lecturers, and task management. According to the Technology Acceptance Model (TAM) developed by Davis (1989), technology adoption is influenced by perceived usefulness and perceived ease of use, both of which contribute to enhanced academic performance.

Recent studies emphasize that digital innovation is not merely a supporting

tool but also a transformative factor that reshapes how students access, process, and apply knowledge (Kotler et al., 2021; Teece, 2018). The integration of digital technologies—such as online learning platforms, virtual assessments, and collaboration tools—enables more personalized and self-paced learning. This digital flexibility is especially beneficial for working students, allowing them to manage academic tasks more efficiently despite busy work schedules. For students who work while pursuing their studies, the role of digital technology is closely tied to time management capabilities. These two elements complement each other in creating an efficient and productive learning process. The Time Management Theory highlights the importance of planning, prioritization, and time control to achieve learning objectives effectively. Research by Britton and Tesser (1991) supports this by finding that students with strong time management skills tend to perform better academically.

The relationship between digital innovation and time management can be viewed as mutually reinforcing. While digital tools enhance efficiency by providing easier access to information, interactive learning materials, and flexible study environments, effective time management ensures that these tools are utilized optimally to achieve academic goals. Together, they create a synergistic effect that improves student performance. Moreover, the integration of digital technologies—such as learning management systems, productivity applications, and communication platforms enables students to plan their study schedules, set priorities, and track progress more effectively. In addition, the Self-Regulated Learning Theory (Zimmerman, 2000) supports this framework by explaining that students who can plan, monitor, and evaluate their own learning processes—often through digital tools—tend to achieve higher academic outcomes. This theory aligns with the idea that both digital innovation and time management are essential for self-directed learning and success in higher education, particularly among working students.

Academic performance, as the dependent variable in this study, is measured through grades, cumulative GPA, and the completion of academic tasks. According to McClelland's Achievement Motivation Theory, internal motivation to succeed can be enhanced through the effective use of technology and proper time management. Thus, motivation acts as an internal drive that links digital utilization and time organization to academic achievement. Based on these theoretical foundations, the research framework assumes that the utilization of digital innovation (X1) and time management (X2) both directly influence academic performance (Y). The more effectively students use digital technology and manage their time, the better their academic outcomes will be.

This study employs multiple linear regression analysis using SPSS to examine the influence of digital technology utilization and time management both partially and simultaneously on academic performance. The data analysis includes tests for

validity, reliability, classical assumptions, correlation, regression, path analysis, and both t- and F-tests.

Hypotheses:
H1: Digital technology utilization has a positive effect on students' academic performance.

This assumption is grounded in the Technology Acceptance Model (Davis, 1989), which suggests that when students perceive digital tools as useful and easy to use, they are more likely to adopt and integrate them into their learning process, leading to improved academic outcomes.

H2: Time management has a positive effect on students' academic performance.

According to Time Management Theory (Britton & Tesser, 1991), students who can plan, prioritize, and control their time efficiently tend to complete academic tasks more effectively, resulting in better academic results.

H3: Digital innovation utilization and time management simultaneously have a significant effect on students' academic performance.

This combined effect suggests that while digital tools enhance flexibility and access to learning resources, proper time management ensures these tools are used strategically to support learning goals. The interaction between these two factors creates a synergistic impact that strengthens overall academic performance. These hypotheses are tested using multiple linear regression analysis, with the goal of empirically verifying whether digital innovation and time management, both separately and together, contribute significantly to the academic success of working university students.

Method

This study employs a quantitative research approach with an associative-causal design to examine the influence of digital innovation utilization and time management on the academic performance of working university students in the era of digital transformation. The quantitative method was chosen because it allows for objective measurement and hypothesis testing to determine the strength and direction of relationships between variables. The population of this study includes active university students who are also employed, and a total of 100 respondents were selected using a purposive sampling technique based on specific criteria: currently enrolled, employed part-time or full-time, and engaged in digital-based learning activities. Data were collected through online questionnaires distributed via Google Forms, containing closed-ended questions measured using a Likert scale.

Before analysis, the questionnaire underwent validity and reliability testing to ensure data accuracy and consistency, with all items proven valid and reliable (Cronbach's Alpha = 0.967). The collected data were analyzed using SPSS version 25, including classical assumption tests (normality, multicollinearity, heteroscedasticity, and autocorrelation) to confirm data suitability. Subsequently, correlation and multiple linear regression analyses were conducted to determine the effects of digital innovation utilization and time management—both partially and simultaneously—on academic performance. The t-test and F-test were applied to assess the significance of each effect, and path analysis was employed to further explore the direct and indirect relationships among the studied variables.

Results

1.Validity Test Results
The validity test results show that all statement items have correlation coefficients above 0.30 and significance values below 0.05. Therefore, all questionnaire items are considered valid and suitable for use in this research.

2. Reliability Test Results

Cronbach's Alpha	Number of Items	Interpretation
0.967	15	Highly Reliable

The Cronbach's Alpha value of 0.967 exceeds the minimum threshold of 0.70, indicating a very high level of reliability. This means that all items in the questionnaire are consistent in measuring the intended variables.

3. Classical Assumption Tests

- Normality: The data are normally distributed.
- Multicollinearity: There is no high correlation among the independent variables (VIF = 4.716 < 10).
- Heteroscedasticity**:** No specific pattern is found in the scatterplot, indicating that the data are free from heteroscedasticity issues.
- Autocorrelation: There is no recurring pattern, meaning the residuals are independent.

All these assumption tests confirm that the data are suitable for multiple linear regression analysis.

4. Correlation Analysis

Variables	r	Sig.	Interpretation
X1 ↔ X2	0.715	0.000	Strong positive correlation

X1 ↔ Y	0.926	0.000	Very strong positive correlation
X2 ↔ Y	0.854	0.000	Very strong positive correlation

The correlation analysis reveals a strong positive relationship between digital innovation (X1), time management (X2), and academic outcomes (Y). The correlation coefficients of X1 ↔ Y = 0.926 and X2 ↔ Y = 0.854, both with significance values of 0.000, indicate very strong and significant correlations among the variables.

5. Regression Analysis

Regression Equation: Y = 0.495 + 0.634X1 + 0.527X2

Model	R	R Square	Adjusted R Square	Std. Error
1	0.926	0.857	0.854	1.357

The regression equation obtained is Y = 0.495 + 0.634X1 + 0.527X2, with an R^2 value of 0.857. This means that 85.7% of the variation in academic performance can be explained by the two independent variables—digital innovation utilization and time management while the remaining 14.3% is influenced by other factors not included in the model.

Table 6. t-Test and F-Test Results

Variable	B	t	Sig.	Interpretation
Constant	0.495	-	-	-
X1	0.634	5.409	0.000	Significant
X2	0.527	6.002	0.000	Significant

The t-test results show that both independent variables significantly affect academic performance. Digital innovation (t = 5.409; Sig. = 0.000) and time management (t = 6.002; Sig. = 0.000) are both significant at the 5% level. This indicates that higher levels of digital innovation utilization and better time management are associated with improved academic achievement among students.

Table 7. Path Analysis

Path	Coefficient (β)	Sig.	Interpretation
X1 → Y	0.452	0.000	Positive significant direct effect
X2 → Y	0.501	0.000	Positive significant direct effect

Path analysis demonstrates that digital innovation utilization (β = 0.452; Sig. = 0.000) and time management (β = 0.501; Sig. = 0.000) have direct and significant effects on

students' academic performance. These results confirm that both variables play a crucial role in enhancing the academic outcomes of working university student.

Discussion

This study aims to determine the influence of digital technology utilization and time management on the academic performance of students who work while studying in the era of digital transformation. Based on the results obtained through valid and reliable instruments, and analyzed using various statistical tests—such as classical assumption tests, correlation analysis, multiple linear regression, path analysis, as well as t- and F-tests—it can be concluded that both independent variables have a significant and positive effect on students' academic performance.

These findings are consistent with Time Management Theory, which emphasizes that the ability to manage time effectively enhances productivity, focus, and academic outcomes. Similarly, the Technology Acceptance Model (TAM) explains that the perceived usefulness and ease of use of digital tools encourage students to adopt technology in ways that improve learning efficiency. In this context, digital innovation serves as an enabler that allows students to access materials, collaborate virtually, and complete academic tasks despite the constraints of work schedules.

This result also supports prior research conducted by Purwanto et al. (2020) and Trueman & Hartley (1996), which found that digital technology and good time management significantly contribute to better learning performance. Students who are able to use digital platforms effectively tend to optimize their study time, demonstrating improved academic results compared to those who face difficulties in managing their time and adapting to digital tools.

From a theoretical perspective, this study enriches the literature on digital learning behavior and student self-regulation by integrating technological adaptation with time management capability. Meanwhile, from a practical perspective, the findings suggest that universities should enhance programs that support working students—such as digital literacy training, time management workshops, and flexible academic schedules. These initiatives can help students balance professional duties with academic demands more effectively.

Furthermore, the results emphasize the importance of self-regulated learning, where students independently manage and evaluate their study process. In the digital era, effective use of technology and good time management strengthen these abilities, leading to improved academic outcomes and essential career skills.

Conclusion

This study demonstrates that the utilization of digital technology and effective time management significantly influence the academic performance of students

who work while pursuing higher education in the era of digital transformation. Both variables are shown to be interrelated and contribute to improved academic achievement among students who face the challenge of balancing work and study responsibilities.

From an academic perspective, this research enriches the existing literature on the role of technology and time management skills in higher education, particularly for students with dual responsibilities. Practically, the findings can serve as a foundation for educational institutions in designing supportive policies or programs for working students, while also encouraging students to use technology effectively and manage their time more efficiently.

Nevertheless, this study has certain limitations, such as the use of a sample drawn only from students at a limited number of universities, which restricts the generalizability of the findings to the broader student population in Indonesia. Furthermore, the use of self-reported questionnaires may introduce bias due to respondents' subjective perceptions. Future research is therefore recommended to employ larger and more diverse samples, along with varied data collection methods such as in depth interviews or direct observation to obtain more comprehensive insights.

Despite these limitations, the study offers meaningful contributions to the development of educational management and the application of digital technology in supporting the academic success of students who balance employment with their studies.

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