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Research Article

THE INFLUENCE OF MANAGERIAL TEAM E-PROJECTS ON STUDENTS' INDEPENDENT ATTITUDES

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Abstract
This study aims to evaluate the impact of the E-Project Managerial Team on fostering independence among Biology Education students at Universitas Jambi Faculty of Teacher Training and Education. The research investigates how managerial technology influences students' ability to manage tasks autonomously in an academic setting. Using a mixed-methods approach with an exploratory sequential design, the study combines quantitative data from questionnaires with qualitative insights. A random sampling method was applied to select participants from 143 students. Data analysis was conducted using IBM SPSS 24, employing descriptive statistics, normality, linearity, and regression tests to interpret the relationships between variables. The normality test returned a significance value of 0.614, while the linearity test showed a value of 0.482, confirming the appropriate distribution and relationships of the data. Results from the regression analysis (F value of 36.487, p = 0.001) revealed a statistically significant positive influence of the E-Project Managerial Team on students' independence. Descriptive analysis also indicated that while some students held neutral views, a considerable portion acknowledged improvements in their self-management and autonomy due to the team's involvement. This research uniquely integrates managerial technology with biology education, highlighting how digital project management tools can enhance student independence. It contributes to the growing literature on educational technology by offering innovative methods for promoting autonomy, time management, and individual skill development among students. This work provides practical insights for educators seeking to implement technological solutions to support self-directed learning.

Keywords: Independent, Influence, Managerial Team E-Projects

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INTRODUCTION

Education today faces various complex challenges and opportunities. The COVID-19 pandemic has forced many educational institutions to shift to online learning, exposing gaps in technology access among students and teachers (Ali, 2020; Azionya & Nhedzi, 2021; Perdana, Zakariah, & Alasmari,

2023; Saputro et al., 2023; Treve, 2021; Asrial et al., 2024). However, this also encourages accelerated adoption of technology and innovation in teaching methods. In addition, a curriculum that is rigid and often irrelevant to the needs of today's world of work adds to the burden on the education system. On the other hand, initiatives to improve teacher competency and the implementation of skills-based learning approaches are starting to be implemented in several places, providing hope for more meaningful and contextual learning. Thus, although challenges remain, there is great potential for improvement through educational reform and technological innovation.

Biology education on campus currently faces various challenges and opportunities. At many colleges, biology curricula continue to evolve to accommodate the latest advances in biological research and technology (Noviar, 2016; Scott et al., 2020; Burley et al., 2021; Apeadido et al., 2024; Ulandari, Ferry, & Damni, 2024). Students are exposed to complex material and require a deep understanding of basic concepts for practical applications in fields such as biotechnology and ecology (Wicaksono et al., 2020; Astuti et al., 2021; Byukusenge et al., 2023; Marta, Khairinal, & Murbojono, 2023). However, not all campuses have adequate laboratory facilities or access to the latest technology, which can hinder the learning and research process (Kibuku et al., 2020; Triyasmina et al., 2022; Mizian, 2023). On the other hand, collaboration between faculty, researchers, and industry offers opportunities for students to engage in relevant research projects and gain practical experience. With initiatives to improve lecturer competency and the integration of technology in teaching, biology education on campus has the potential to continue to improve and be more relevant to the needs of industry and scientific research.

According to Nurfitria et al., (2021), independence in learning is the ability of students to organize and direct their own learning process without too much dependence on external guidance. Learning independence as self-control over all aspects of the learning process, which includes setting goals, choosing strategies, and evaluating learning outcomes (Barkhatova et al., 2020; Darminto & Muhamad Khoirudin, 2021, Yusindar et al., 2024). Independent learning involves students being proactive in diagnosing their own learning needs, formulating learning goals, identifying resources for learning, selecting and implementing learning strategies, and evaluating learning outcomes (Azis & Clefoto, 2024; Mardiati, Alorgbey, & Zarogi, 2024). Other research by Tanti et al., (2020) states that independence in learning involves self-regulation, where students actively monitor and regulate their cognition, motivation, and behavior in the learning context. The results of these studies show that independence in learning not only improves understanding and retention of material but also prepares students to become lifelong learners who are able to adapt to changes and challenges in the future.

An attitude of independence in student learning is very important because it supports a more effective and meaningful teaching and learning process (Reeve & Cheon, 2021; Ferrer et al., 2022; Nurhayati et al., 2022; Sa'diyah et al., 2022; Asrial et al., 2024). When students have independence, they are better able to manage their time, find additional learning resources, and develop a deeper understanding of the material studied. This also encourages them to be more proactive in discussing, asking questions, and participating in academic and research activities. Learning independence students to be better prepared to face academic and professional challenges in the future because they are used to thinking critically and solving problems independently (Dekker, 2020; Warr & West, 2020: Thornhill-Miller et al., 2023). Apart from that, lecturers also benefit from having independent students because they can focus more on deeper learning and more productive discussions rather than having to constantly direct and motivate students to learn. Thus, an attitude of independence in learning strengthens a dynamic and collaborative educational ecosystem, producing graduates who are competent and ready to contribute in various fields.

Technological developments and digitalization have brought significant changes in education, affecting learning methods as a whole (Trends et al., 2020; Pettersson, 2021; Timotheou et al., 2023; Cadiz et al., 2024; Baah, Konovalov, & Tenzin, 2024; Mustakim et al., 2024). Technologies such as the internet, educational software, and online learning platforms have enabled access to a wider and more diverse range of learning resources, making education more inclusive and flexible (Ossiannilsson, 2020; Jeffery et al., 2021; Arifuddin, Sujana, & Nawawi, 2023; Asmororini, Kinda & Sen, 2024; Suaidi, Pius, & Mengo, 2024). Learning methods are now more interactive and collaborative, with the use of tools such as virtual simulations, interactive videos, and augmented reality (AR) enabling deeper understanding of concepts (Dhar et al., 2021; Scavarelli et al., 2021; Ahmad et al., 2024; Asia, Kinda, & Edwards, 2024). Digitalization also enables personalized learning, where analytical technologies and artificial intelligence can help identify individual learning needs and adapt material and learning pace according to each student's abilities (Hashim et al., 2022; Tapalova & Zhiyenbayeva, 2022; Ahmad et

al., 2024). Additionally, The research gap lies in the lack of exploration of how the mentioned technological developments and digitalization have influenced students' independent attitudes within specific educational contexts, such as biology education. Existing research has not thoroughly considered the use of interactive technologies and personalized learning in enhancing students' independence. Additionally, there has been no in-depth study on how these digital tools can be effectively integrated into distance learning to support independent attitudes.

E-Project Managerial Team is a project management concept that utilizes digital platforms and technology to manage, coordinate, and supervise projects effectively. The basic definition of an E-Project Managerial Team involves the use of project management software that allows teams to collaborate in real-time, access project data, track progress, and organize tasks and resources from anywhere and at any time. This concept focuses on efficiency and transparency, where all team members can communicate effectively, share information, and provide instant status updates through digital tools. With the E-Project Managerial Team, decision-making can be done more quickly and based on accurate data, reducing the risk of errors and ensuring the project runs according to schedule and budget (Budiarti et al., 2023; Yohanie et al., 2023; Zakiyah, Boonma, & Collado, 2024). Additionally, these digital platforms usually come with features such as document management, scheduling, reporting, and analytics that help project managers monitor performance and make better plans.

This research identifies the gap between the use of the E-Project Managerial Team and the development of independence among biology education students, due to the lack of studies evaluating the impact of project management technology on independence attitudes. The urgency of this research lies in the need to prepare students to learn independently in the digital era, with the hope that the results will provide guidance for educational institutions. In the problem-solving plan, this research will use surveys to measure independence attitudes and data analysis to gain deeper insights. The main objectives are to evaluate the influence of the E-Project Managerial Team, identify the skills that develop, and provide recommendations for innovative learning methods that leverage technology to enhance the effectiveness and efficiency of learning.

RESEARCH METHOD

This research adopts a mixed approach, which combines quantitative and qualitative methods in one study to provide a more comprehensive understanding (Hernawan et al., 2024; Yousefi Nooraie et al., 2018). The research design used is the Explanatory Sequential Design, where primary data is first obtained through quantitative data collection and analysis, and then the results are further explained using a qualitative approach. In the quantitative approach, for example, researchers may use survey methods to gather data from a large number of respondents, such as structured questionnaires completed by participants to measure specific variables. After the quantitative data is analyzed and initial findings are identified, the qualitative phase is conducted to explore and explain those results in more depth. For instance, in-depth interviews or focus group discussions can be employed to gain a deeper understanding of the factors influencing the quantitative outcomes, providing context, and uncovering the reasons behind the findings. This design allows researchers to comprehensively understand the studied phenomenon by combining the strengths of both quantitative and qualitative approaches (Draucker et al., 2020; Wipulanusat et al., 2020). The main instrument in this study was the Independence Attitude questionnaire adopted from the research of (Isma et al., 2023). with a Cronbach's alpha value of 0.908, which functions as a data collection tool by distributing written statements to the research sample. This questionnaire consists of 17 items that have been validated, with Likert scale categories including strongly agree (SS), agree (S), not sure (N), disagree (TS), and strongly disagree (STS). Each positive item is rated with SS = 5, S = 4, N = 3, TS = 2, and STS = 1, while the values for negative items are reversed. This questionnaire was designed to measure the impact of using the Managerial Team E-Project on the attitude of independence of biology education students, with the aim of obtaining relevant quantitative data.

Table 1. Research questionnaire grid

Indicator	Questionnaire Item
Time and Task Management	• I can manage my time well when using E-Project Managerial Team. • I can manage my tasks and responsibilities more effectively with the help of E-Project Managerial Team. • E-Project Managerial Team helps me in managing project schedules efficiently.
Team Collaboration and Interaction	• E-Project Managerial Team increases my motivation to complete my tasks. • I find it easier to collaborate with team members thanks to E-Project Managerial Team. • E-Project Managerial Team makes me more involved and active in team discussions. • E-Project Managerial Team encourages me to take initiatives in projects.
Project Monitoring and Evaluation	• I can monitor the progress of my project better using E-Project Managerial Team. • I can evaluate the progress and results of my work more effectively using E-Project Managerial Team. • E-Project Managerial Team helps me in solving problems that arise during the project.
Accessibility and Flexibility in Learning	• E-Project Managerial Team helps me in setting learning goals independently. • E-Project Managerial Team makes it easier for me to access various learning resources needed. • E-Project Managerial Team provides flexibility in how I learn and complete assignments. • I am satisfied with the use of E-Project Managerial Team in supporting my learning.

The subjects in this study were Biology Education students from Faculty of Teacher Training and Education Jambi University. The samples involved used random sampling techniques from 143 populations, the selection of which was based on certain criteria relevant to the research objectives. This technique considers various factors to ensure that the samples taken are truly in accordance with the research needs. This study uses a mixed approach that aims to determine the effect of the use of E-Project Managerial Team on students' attitudes of independence, by combining quantitative and qualitative data to gain a more comprehensive understanding. Through a quantitative approach, it is expected to obtain representative data regarding the effects of this project management technology on students' independent skills in the context of biology education. Furthermore, these quantitative results will be explained and deepened with qualitative data, such as interviews or focus group discussions (FGDs), to further explore students' experiences and views on the use of E-Project Managerial Team in supporting their independence. This mixed approach allows researchers to capture richer and deeper nuances of the influence of technology on students' attitudes and independent skills.

This study employs a mixed-methods approach, combining quantitative and qualitative analyses to understand the influence of the E-Project Managerial Team on students' independent attitudes. The quantitative analysis uses simple linear regression to examine the relationship between the use of the E-Project Managerial Team (independent variable) and students' independence (dependent variable). By testing the null hypothesis (H_0: $b = 0$) through p-value and R^2, the study determines the significance and variance explained by the model. If the p-value is less than 0.05, the null hypothesis is rejected, indicating a significant impact. The qualitative analysis, conducted through interviews or focus group discussions (FGDs), uses content analysis to identify themes that explain how the E-Project Managerial Team promotes independence by fostering initiative, time management, and problem-solving skills. When both quantitative results are significant and supported by qualitative insights, the conclusion is

that the E-Project Managerial Team positively influences students' autonomy and learning independence.

RESULTS AND DISCUSSION

An attitude of independence is an individual's ability to organize and manage their learning or work process independently without excessive dependence on external guidance or supervision. This includes personal initiative in setting goals, planning, and carrying out tasks, as well as the ability to evaluate results and make decisions independently (Widiastuty & Rahayu, 2021). An attitude of independence also involves responsibility for one's own actions and work results, as well as skills in overcoming challenges and solving problems creatively. In an educational context, this attitude is important because it helps students to become proactive learners, increases motivation, and prepares them to function effectively in a dynamic professional environment.

The use and utilization of managerial team e-projects in learning aims to increase student independence. Utilizing this technology allows students to manage projects more efficiently, which contributes to the development of their independent skills. The results obtained from implementing the managerial team e-project were measured through a questionnaire, which revealed students' independent attitudes. Furthermore, the results of descriptive statistical analysis calculations from the collected data were analyzed using the IBM SPSS 24 application, which provides a quantitative description of the effect of using the E-Project Managerial Team on students' independent attitudes. With this analysis, it is hoped that in-depth insight can be obtained regarding the effectiveness of this technology in supporting the learning process and developing student independence.

Table 2. Descriptive Statistics of Student Responses

Characteristics			Mean	Min	Max	Median	Std. Deviasi	%
Interval	Category	Total						
40-43	Strongly Agree	5						16.67
44-47	Agree	7						23.33
48-51	Neutral	14	49.71	40	59	48	4.732	46.67
52-55	Disagree	3						10.00
56-59	Strongly Disagree	1						3.33
Total		30						100

Based on Table 2, it can be concluded that the data results show the distribution of student attitudes towards the use of managerial team e-projects in the context of independence, based on the categories given. From this table, the majority of students fall into the "neutral" category, with a percentage reaching 46.67%, indicating that the majority feel not too affected or are unsure about the impact of using the E-Project Managerial Team on their attitude of independence. The "agree" category followed with 23.33%, indicating that there is a significant proportion of students who feel that the use of this technology supports their independence. In contrast, the "strongly agree" category reached 16.67%, indicating that a number of students felt very positive about this impact. The categories "disagree" and "strongly disagree" have a percentage of 10.00% and 3.33%, respectively, indicating that only a few students feel that the use of the E-Project Managerial Team has no effect or even hinders their independence. Overall, this data shows that although there is positive support for the use of this technology, there are still many students who are neutral or less sure about its benefits in increasing attitudes of independence. After carrying out descriptive statistical analysis, assumption tests were then carried out, namely normality and linearity tests using IBM Statistics SPSS 24.

Table 3. Normality Test and Linearity Test

Normality Test		Linearity Test	
Sig. (2-tailed)	Std. Deviation	Sig.	Mean Square
.614	.4179262	0.482	.132

Table 4. Regression Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	45,689	1	45,689	36,487	,001
Residual	12,311	28	,439		
Total	58,000	29			

Based on table 3, the results of the normality test and linearity test in the table show that the data in this study meets the basic assumptions of regression analysis. The significance value for the normality test is 0.614, which is greater than 0.05, indicating that the data distribution follows a normal distribution pattern. In addition, the results of the linearity test show a significance value of 0.482, which is also greater than 0.05, indicating that the relationship between the variables in the regression model is linear. Thus, the data were not only normally distributed but also showed a linear relationship in accordance with the regression assumptions, supporting the validity of the model used in the analysis.Next, a hypothesis test was carried out using a regression test with IBM Statistics SPSS 24. The results obtained are based on table 2. The results of the regression test show that the regression model used to evaluate the influence of the E-Project Managerial Team on the independence of Biology Education students gave significant results. From the table, the sum of squares for the regression is 45.689 with a mean square of 45.689 and an F value of 36.487. The significance value (Sig.) for this test is 0.001, which is much smaller than the significance limit of 0.05. This indicates that the use of the E-Project Managerial Team significantly influences student independence, showing that the regression model is successful in explaining the strong and relevant relationship between the variables studied.

This is in line with research conducted by **(**Müller & Wulf, 2020), who said that the application of managerial technology in an educational context significantly increases student independence. The research shows that effective integration of managerial tools in the teaching and learning process can improve time management, increase individual skills, and increase motivation, thereby contributing to better learning outcomes and greater student independence. The results of this research support these findings by showing that the Managerial Team E-Project has a significant positive impact on the independence of Biology Education students.

The novelty in this research lies in the application of the E-Project Managerial Team as an innovative tool in the context of biology education, which has not been widely explored in previous studies. This research provides new insight into how the use of managerial technology can increase student independence, especially in the field of biology education. By utilizing the E-Project Managerial Team, this research shows a new way to manage projects and learning activities that supports the development of students' independent skills, which has previously received little attention in the academic literature. In addition, this research presents a comprehensive evaluation method by combining quantitative and qualitative analysis to assess the impact of the technology. This approach not only measures results statistically but also explores students' experiences in depth, providing a more holistic understanding of the effectiveness of the E-Project Managerial Team in increasing their independence. This novelty offers a significant contribution to the way we understand and apply technology in education, especially in increasing student learning independence.

This study demonstrates that the use of the E-Project Managerial Team has a significant impact on improving the independence of Biology Education students, which can be generalized to similar educational contexts. The findings suggest that managerial technology can help enhance students' time management, initiative, and responsibility. The novelty of the research lies in the application of this technology in the field of Biology Education, which has not been extensively studied before, as well as the evaluation approach that combines quantitative and qualitative analysis. The limitations of this study include a small sample size and a scope limited to one field of study, so further research with larger samples and in various disciplines is needed. The recommendation for educational institutions is to be more active in integrating managerial technology, such as the E-Project Managerial Team, into the learning process, with long-term evaluations to observe its sustained impact on student independence.

CONCLUSION

The conclusion of this research reveals that the data obtained meets the basic assumptions for regression analysis. The normality test shows a significance value of 0.614, which is greater than 0.05, indicating that the data distribution is normal. In addition, the results of the linearity test with a

significance value of 0.482, which is also greater than 0.05, indicate that the relationship between the variables in the regression model is linear. These two results support the validity of the regression model used in the analysis, ensuring that the data is not only normally distributed but also shows the linear relationship required for a valid regression test. The regression test carried out showed significant results with an F value of 36.487 and a p value (Sig.) of 0.001, which is far below the significance limit of 0.05. This indicates that the use of the E-Project Managerial Team has a significant influence on the independence of Biology Education students. This research proves that managerial technology can effectively increase student independence, supporting findings from previous studies that show significant benefits from technology integration in education. Thus, the regression model used succeeded in explaining the strong and relevant relationship between the E-Project Managerial Team and increasing student independence.

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AUTHOR CONTRIBUTIONS

Conceptualization, RSB.; methodology, H. and RSB.; formal analysis, RSB.; investigation, H.; resources, RSB.; data curation, H supervisor in research activities to article writing, reviewed and edited H. and RSB.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

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