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The Effect of Digital Teaching Modules, School Facilities, and Parental Support on the Learning Independence of Tenth-Grade Students at MAN 2 Kediri City

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Abstract

Self-regulated learning is an essential competency that supports students' academic success in the digital era. However, students' learning independence is influenced by external factors, including the use of digital teaching modules, the availability of school facilities, and parental support. This study aims to examine the influence of digital teaching modules, school facilities, and parental support on the self-regulated learning of Grade X students at MAN 2 Kota Kediri, both partially and simultaneously. A quantitative approach with an explanatory research design was employed. The population consisted of 504 Grade X students, and 223 respondents were selected using random sampling based on the Slovin formula. Data were collected through questionnaires that met validity and reliability requirements and were analyzed using multiple linear regression with IBM SPSS Statistics 23. The findings indicate that digital teaching modules have a positive and significant effect on self-regulated learning, with a regression coefficient of 0.565 and a significance value of 0.000. School facilities also have a positive and significant effect, with a regression coefficient of 0.563, while parental support has a positive and significant effect, with a regression

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coefficient of 0.262. Simultaneously, the three independent variables significantly influence self-regulated learning, as indicated by an F-value of 157.444 and a significance value of 0.000. The coefficient of determination (R^2) of 0.683 indicates that 68.3% of the variance in students' self-regulated learning can be explained by digital teaching modules, school facilities, and parental support. This study concludes that strengthening students' self-regulated learning requires integrated support through the optimization of digital learning technologies, adequate school facilities, and active parental involvement. The findings contribute to the literature on technology-supported learning independence and provide practical implications for schools and families in developing effective strategies to foster students' self-regulated learning.

Keywords: Digital Teaching Modules; Parental Support; School Facilities; Self-Regulated Learning; Student Learning Independence

INTRODUCTION

Education plays a strategic role in developing human resources who possess knowledge, skills, and character necessary to contribute effectively to society and national development (Dewi & Ulfiah, 2021). Along with the rapid advancement of technology and globalization, educational institutions are required to adopt more adaptive learning approaches that prepare students to face increasingly complex challenges (Fadilah et al., 2021). Consequently, educational practices have gradually shifted from teacher-centered instruction toward student-centered learning, emphasizing students' active participation and responsibility in the learning process (Wijayanto et al., 2025).

One of the essential competencies required in student-centered learning is self-regulated learning. Self-regulated learning refers to students' ability to independently plan, organize, monitor, and evaluate their own learning activities to achieve predetermined learning objectives (Permatasari et al., 2021). This competency enables students to become more responsible for their academic progress and less dependent on direct teacher supervision. Students who demonstrate strong self-regulated learning generally exhibit higher levels of discipline, persistence, and commitment in completing academic tasks (Werdiningsih & Khoerunisa, 2021). In addition, motivated students tend to show stronger initiative and consistency in managing their learning activities independently (Wardani et al., 2021).

The importance of self-regulated learning has become increasingly evident in contemporary education, where students are expected to actively construct knowledge and continuously develop their competencies. According to Kurniasih et al. (2021), self-regulated learning is influenced by various factors originating from both internal and external environments. Among the external factors, digital learning resources, educational facilities, and parental support are considered important determinants of students' learning independence.

One educational innovation that has gained significant attention in recent years is the use of digital teaching modules. Digital teaching modules are technology-based instructional materials that can be accessed through various digital devices to support learning activities (Fitri et al., 2023). Unlike conventional printed materials, digital modules offer greater flexibility because students can access learning resources anytime and anywhere according to their individual learning needs. The integration of multimedia elements within digital modules also contributes to increased student engagement during the learning process (Lastri, 2023).

Digital teaching modules are particularly relevant within the implementation of modern curricula that emphasize student autonomy and differentiated learning. Well-designed digital modules provide systematic learning materials, interactive exercises, and self-assessment features that allow students to learn independently with minimal teacher assistance (Nuraini et al., 2022). Through these features, students can regulate their learning pace, review difficult concepts repeatedly, and monitor their own learning progress. Therefore, digital teaching modules have substantial potential to strengthen students' self-regulated learning.

Empirical studies have supported the effectiveness of digital teaching modules in educational settings. Fajariyah et al. (2024) reported that the use of context-based digital modules significantly improved students' learning outcomes while enhancing their learning motivation. Similarly, Sholikha et al. (2022) found that digital modules played an important role in supporting students enrolled in accelerated semester credit programs by facilitating independent learning activities. These findings indicate that digital learning resources can contribute positively to the development of learning independence among students.

Besides digital learning resources, school facilities represent another important factor that influences students' learning experiences. School facilities encompass various

educational resources and infrastructures that support teaching and learning activities, including classrooms, libraries, laboratories, technological devices, and internet access (Br Nasution et al., 2023). The availability of adequate facilities creates a conducive learning environment that enables students to access information and engage actively in academic activities.

Educational facilities are essential because they provide students with opportunities to explore learning resources independently beyond classroom instruction. Adequate infrastructure can improve students' comfort, concentration, and learning effectiveness during educational activities (Mantiri et al., 2022). Furthermore, school facilities include not only physical infrastructure but also technological resources that support digital learning implementation (Susiani, 2022). In the context of technology-based education, access to digital facilities becomes increasingly important for promoting independent learning behavior.

The role of technological facilities in supporting self-regulated learning has been emphasized by several scholars. Access to internet connectivity and digital learning tools allows students to utilize online resources more effectively and expand their learning opportunities beyond traditional classroom settings (Fathoni & Sobandi, 2020). Conversely, inadequate facilities may limit students' ability to access educational resources and participate fully in digital learning activities (Nuzli, 2021).

Previous studies have also demonstrated a positive relationship between educational facilities and learning independence. Ubaidillah & Imami (2023) found that learning facilities significantly influenced students' self-regulated learning in mathematics education. Likewise, Nugraha (2023) reported that adequate educational facilities positively affected students' academic achievement by creating a more supportive learning environment. These findings suggest that school facilities contribute not only to academic performance but also to the development of students' independent learning behavior.

In addition to educational facilities, parental support remains a crucial factor influencing students' educational development. Parents serve as the primary educational agents within the family environment and play a significant role in shaping children's attitudes toward learning (Mustika, 2021). Parental support may take various forms, including emotional encouragement, academic supervision, provision of learning resources, and

motivational assistance. Such support helps students develop confidence and responsibility toward their educational activities.

Parental involvement becomes increasingly important when students are expected to learn independently outside the classroom. Students who receive adequate support from their parents tend to demonstrate stronger motivation and greater commitment to academic responsibilities (Rosalina & Yamlean, 2021). Through effective communication and continuous encouragement, parents can help students develop positive learning habits and stronger self-management skills.

The importance of parental support has been confirmed by previous empirical studies. Sulastri & Mayra (2022) found that parental support significantly influenced children's learning independence by fostering self-confidence and decision-making abilities. Furthermore, Hia et al. (2022) reported that students who received consistent parental support exhibited higher motivation and greater confidence in completing academic tasks independently. These findings indicate that parental involvement contributes significantly to the development of self-regulated learning.

The relevance of digital teaching modules, school facilities, and parental support is particularly evident in the educational context of MAN 2 Kota Kediri. The school has implemented various digital learning initiatives and provides educational facilities that support academic activities. However, preliminary observations indicate that challenges remain regarding the utilization of digital learning resources, access to educational facilities, and variations in parental involvement. These conditions may influence students' ability to manage and direct their learning activities independently.

A review of previous studies indicates that research concerning digital teaching modules, school facilities, and parental support has generally been conducted separately. Fajariyah et al. (2024) examined the influence of digital teaching modules on learning outcomes. Ubaidillah & Imami (2023) investigated the relationship between educational facilities and learning independence. Sulastri & Mayra (2022) focused on the role of parental support in fostering learning independence. Although these studies provide valuable insights, they do not comprehensively explain the combined influence of these factors on students' self-regulated learning.

Addressing this gap, the present study offers novelty by integrating digital teaching modules, school facilities, and parental support into a single analytical framework to examine

their combined influence on self-regulated learning among Grade X students at MAN 2 Kota Kediri. This integrated approach provides a broader perspective on the technological, institutional, and familial factors that shape students' learning independence, extending beyond the partial analyses conducted in previous studies. The study is grounded in the concept of self-regulated learning, which emphasizes students' ability to independently plan, manage, monitor, and evaluate their learning activities (Gumilar & Hermawan, 2021). Within this framework, digital teaching modules serve as learning resources that facilitate autonomous learning, school facilities provide environmental support for effective learning experiences, and parental support offers motivational and emotional reinforcement that encourages students to take responsibility for their own learning. Accordingly, this study aims to examine both the partial and simultaneous effects of digital teaching modules, school facilities, and parental support on self-regulated learning among Grade X students at MAN 2 Kota Kediri.

METHODS

This study employed a quantitative approach because the collected data were numerical and analyzed statistically to examine the relationships among variables (Fadilla et al., 2022). The research adopted a causal-comparative (explanatory) design to investigate the influence of independent variables on a dependent variable without manipulating the research subjects directly (Sahir, 2021). The study was conducted at Madrasah Aliyah Negeri (MAN) 2 Kediri City, Indonesia, from February to July 2026. The research examined three independent variables, namely digital teaching modules (X_1), school facilities (X_2), and parental support (X_3), and one dependent variable, namely students' self-regulated learning (Y).

The research design was developed based on the theoretical indicators of each variable. Digital teaching modules were measured through indicators of module design and module benefits (Rantina et al., 2023). School facilities were assessed through classroom comfort, library availability, laboratory facilities, technology access, and the physical condition of the school environment (Sahpitri & Poppy, 2025). Parental support was measured using indicators of need fulfillment, provision of learning facilities, and effective communication (Rosalina & Yamlean, 2021). Self-regulated learning was evaluated through

indicators of learning planning, responsibility in the learning process, self-management, and learning initiative (Purba et al., 2024).

The population consisted of all tenth-grade students of MAN 2 Kediri City during the 2024/2025 academic year, totaling 504 students. A random sampling technique was employed because it provides equal opportunities for all population members to be selected as respondents (Dhonna, 2022). The sample size was determined using the Slovin formula with a 5% margin of error, resulting in 223 students as research participants.

Data were collected using a structured questionnaire as the primary research instrument. The questionnaire consisted of closed-ended statements measured using a five-point Likert scale ranging from strongly disagree to strongly agree (Suasapha, 2020). Digital teaching modules were represented by ten items, school facilities by ten items, parental support by eight items, and self-regulated learning by ten items. Instrument validity was tested using Pearson Product-Moment correlation analysis through IBM SPSS Statistics version 23. An item was considered valid when the significance value was below 0.05 and the correlation coefficient exceeded the critical r-table value. Instrument reliability was evaluated using Cronbach's Alpha, with values greater than 0.60 indicating acceptable internal consistency (Syahrizal & Jailani, 2023).

The data collection process began with identifying the research problem through preliminary observations conducted during the School Field Practice Program (PLP). After obtaining institutional approval, questionnaires were distributed to the selected respondents. Supporting information was also obtained through interviews with teachers and homeroom teachers to provide contextual understanding of the quantitative findings. Subsequently, all responses were coded and prepared for statistical analysis.

Data analysis was performed using IBM SPSS Statistics version 23. Descriptive statistics were first employed to describe respondent characteristics and research variables. Classical assumption tests were then conducted, including normality, multicollinearity, and heteroscedasticity tests, to ensure that the regression model satisfied the required assumptions (Sudariana & Yoedani, 2021). Multiple linear regression analysis was subsequently applied to examine the effects of digital teaching modules, school facilities, and parental support on students' self-regulated learning. Hypothesis testing was conducted using t-tests to determine partial effects and F-tests to determine simultaneous effects (Widodo, 2021). The coefficient of determination (R^2) was also calculated to identify the proportion of

variance in self-regulated learning explained by the independent variables included in the model. Through these procedures, the study generated empirical evidence regarding the influence of digital teaching modules, school facilities, and parental support on students' self-regulated learning at MAN 2 Kediri City.

RESULTS

1. Normality Test

The normality test was conducted to determine whether the residual data in the regression model were normally distributed. The results of the Kolmogorov–Smirnov test are presented in Table 1.

Table 1. Results of the Normality Test

		Unstandardized Residual
N		223
Normal Parameters[a.b]	Mean	,0000000
	Std. Deviation	5,60908698
Most Extreme Differences	Absolute	,039
	Positive	,035
Test Statistic	Negative	-,039
Asymp. Sig. (2-tailed)		,039
		,200[c.d]

Table 1 Results of the Normality Test shows that the significance value obtained from the Kolmogorov–Smirnov test was 0.200. Since this value exceeded the significance threshold of 0.05, the residuals were normally distributed. Therefore, the normality assumption was satisfied, indicating that the regression model met one of the fundamental requirements for further statistical analysis.

2. Multicollinearity Test

The multicollinearity test was conducted to determine whether strong correlations existed among the independent variables included in the regression model. This test was assessed using tolerance and Variance Inflation Factor (VIF) values. The results are presented in Table 2.

Table 2. Results of the Multicollinearity Test

Coefficients			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Digital Teaching Modules	0,819	1,221
	School Facilities	0,834	1,200
	Parental Support	0,834	1,199
a. Dependent Variable: Self-Regulated Learning			

Table 2 Results of the Multicollinearity Test shows that all tolerance values were greater than 0.10 and all VIF values were considerably lower than 10. These findings indicate that no multicollinearity problem existed among the independent variables. Consequently, each predictor contributed unique information to the regression model and could be included simultaneously in the analysis.

3. Heteroscedasticity Test

The heteroscedasticity test was performed to examine whether the residual variance remained constant across observations. The test was conducted using a scatterplot analysis. The results are presented in Figure 1.

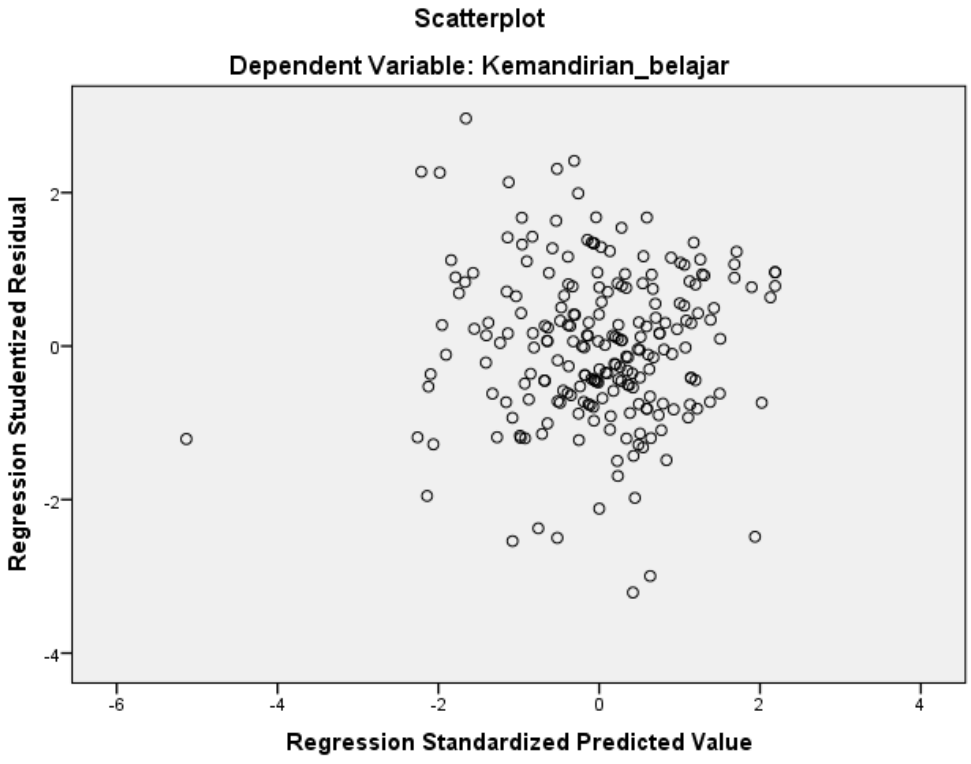

Figure 1. Results of the Heteroscedasticity Test

Figure 1 Results of the Heteroscedasticity Test shows that the residual points were randomly distributed above and below the zero line and did not form any specific pattern. The absence of systematic patterns indicates that heteroscedasticity was not present in the regression model. Therefore, the assumption of homoscedasticity was fulfilled.

4. Multiple Linear Regression Analysis

Multiple linear regression analysis was employed to examine the effects of digital teaching modules, school facilities, and parental support on students' self-regulated learning. The results are presented in Table 3.

Table 3. Results of Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	15,022	2,696		5,571	0,000
	Digital Teaching Modules	0,565	0,069	0,382	8,149	0,000
	School Fasilities	0,563	0,067	0,392	8,458	0,000
	Parental Support	0,262	0,049	0.239	5,319	0,000

a. Dependent variabel: Self-Regulated Learning

Table 3 Results of Multiple Linear Regression Analysis shows that all independent variables had positive regression coefficients and statistically significant relationships with students' self-regulated learning. Among the predictors, school facilities exhibited the strongest standardized coefficient (β = 0.392), followed by digital teaching modules (β = 0.382) and parental support (β = 0.239). These findings suggest that improvements in school facilities contributed most strongly to enhancing students' learning independence, although all three variables played significant roles.

5. Partial Significance Test (t-test)

The t-test was conducted to determine the individual effect of each independent variable on students' self-regulated learning. The results are presented in Table 4.

Table 4. Results of the Partial Significance Test

Model		Unstabdardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	15,022	2,696		5,571	0,000
	Digital Teaching Modules	0,565	0,069	0,382	8.149	0,000
	School Facilities	0,563	0,067	0,392	8.458	0,000
	Parental Support	0,262	0,049	0,239	5.319	0,000

. Dependent Variabel: Self-Regulated Learning

Table 4 Results of the Partial Significance Test shows that digital teaching modules, school facilities, and parental support each had a significant effect on students' self-regulated learning. All significance values were below 0.05, indicating that each variable independently contributed to explaining variations in learning independence among students.

6. Simultaneous Significance Test (F-test)

The F-test was conducted to determine whether the independent variables collectively influenced the dependent variable. The results are presented in Table 5.

Table 5. Results of the Simultaneous Significance Test
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13750,412	3	4583,471	157,444	0,000[b]
	Residual	6375,485	219	29,112		
	Totaal	20125,897	222			

a. Dependent Variabel: Self-Regulated Learning

b. Predictors: (Constant), Digital Teaching Modules, School Facilities, Parental Support

Table 5 Results of the Simultaneous Significance Test shows that the regression model was statistically significant. The significance value of 0.000 indicates that digital teaching modules, school facilities, and parental support simultaneously affected students' self-regulated learning. This finding demonstrates that learning independence is influenced by the combined contribution of educational technology, supportive school environments, and family involvement.

7. Coefficient of Determination

The coefficient of determination analysis was conducted to assess the extent to which the independent variables explained variations in students' self-regulated learning. The results are presented in Table 6.

Table 6. Results of the Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,827[a]	0,683	0,679	5,39554

a. Predictors: (Constant), Digital Teaching Modules, School Facilities, Parental Support

b. Dependent Variabel: Self-Regulated Learning

Table 6 Results of the Coefficient of Determination shows that the coefficient of determination (R^2) was 0.683, indicating that 68.3% of the variance in students' self-regulated learning could be explained by digital teaching modules, school facilities, and parental

support. The remaining 31.7% was influenced by other factors outside the scope of this study. Furthermore, the adjusted R^2 value of 0.679 suggests that the regression model possessed strong explanatory power and remained stable after accounting for the number of predictors included in the model.

DISCUSSION

This study examined the influence of digital teaching modules, school facilities, and parental support on the self-regulated learning of Grade X students at MAN 2 Kota Kediri. The findings revealed that all three independent variables exerted positive and significant effects on students' self-regulated learning, both individually and collectively. These results indicate that learning independence is not solely determined by students' personal characteristics but is also shaped by external learning environments, including technological resources, educational infrastructure, and family support. Furthermore, the coefficient of determination demonstrated that the three variables jointly explained a substantial proportion of the variance in students' self-regulated learning, highlighting their importance in fostering autonomous learning behavior.

The findings showed that digital teaching modules significantly contributed to students' self-regulated learning. This result suggests that technology-based instructional materials provide students with greater flexibility and autonomy in managing their learning activities. Through digital modules, students can access learning resources at their own pace and revisit instructional content whenever necessary. Such flexibility encourages students to take greater responsibility for planning, monitoring, and evaluating their learning processes. From the perspective of self-regulated learning theory, these characteristics support the development of independent learning behaviors by promoting active engagement with educational content. The findings are consistent with those reported by Sholikha et al. (2022), who found that digital modules facilitate independent understanding of learning materials among students. Similarly, the results support the study conducted by Fajariyah et al. (2024), which demonstrated that digital modules enhance learning motivation through interactive and contextually relevant content. Therefore, this study reinforces the argument that digital learning resources serve not only as instructional media but also as mechanisms for cultivating students' learning autonomy.

School facilities were also found to have a positive and significant influence on self-regulated learning. Among the three predictors, school facilities exhibited the strongest standardized effect, indicating that educational infrastructure plays a particularly important role in supporting students' learning independence. Adequate facilities, including comfortable classrooms, libraries, laboratories, internet access, and other learning resources, create an environment that encourages students to engage actively in learning activities. Such facilities enable students to access information independently, conduct academic exploration, and develop problem-solving skills beyond classroom instruction. These findings are in line with Ubaidillah & Imami (2023), who reported that learning facilities significantly affect students' learning independence. The results also support Nugraha (2023), who found that educational facilities contribute positively to learning effectiveness and academic achievement. Consequently, this study extends existing evidence by demonstrating that educational infrastructure is not merely a supporting element of teaching and learning activities but also a critical factor in fostering students' self-directed learning behavior.

Parental support was likewise identified as a significant determinant of self-regulated learning. Although its contribution was relatively smaller than that of digital teaching modules and school facilities, parental support remained an important factor influencing students' learning independence. Parents contribute to students' educational development through motivation, supervision, communication, and the provision of learning resources. These forms of support help students develop responsibility, discipline, and confidence in managing their academic activities. The findings are consistent with the study conducted by Sulastri & Mayra (2022), which concluded that parental support contributes to children's independence through the development of self-management and decision-making abilities. Likewise, the results align with Rosalina & Yamlean (2021), who reported that parental involvement positively influences students' motivation and academic achievement. Therefore, this study confirms that family environments remain essential in supporting the successful development of self-regulated learning among students.

The simultaneous effect of digital teaching modules, school facilities, and parental support further highlights the multidimensional nature of self-regulated learning. The findings indicate that students' learning independence emerges from the interaction of technological, institutional, and familial factors. Digital teaching modules provide flexible access to learning resources, school facilities create supportive learning environments, and parental support strengthens students' motivation and emotional readiness to learn

independently. The integration of these three factors creates conditions that enable students to take greater control of their learning processes. This finding extends previous studies that generally examined these variables separately. By integrating all three variables into a single analytical framework, the present study offers a more comprehensive explanation of the external factors shaping students' self-regulated learning.

From a theoretical perspective, this study contributes to the development of self-regulated learning literature by emphasizing the importance of external environmental factors in fostering learning independence. While previous discussions of self-regulated learning often focus on internal characteristics such as motivation, self-efficacy, and learning strategies, the findings demonstrate that supportive learning environments are equally important in facilitating autonomous learning behavior. Thus, the study provides empirical evidence that self-regulated learning should be understood as the result of interactions between individual and environmental factors.

Practically, the findings provide valuable implications for educational institutions and policymakers. Schools should continue to improve educational facilities and maximize the utilization of digital teaching modules to support independent learning. Furthermore, stronger collaboration between schools and parents is necessary to ensure consistent support for students both inside and outside the classroom. Educational policymakers may also consider integrating digital learning initiatives with broader efforts to strengthen school infrastructure and family engagement. Such integrated strategies are likely to enhance students' capacity for lifelong learning in increasingly digital educational environments.

Despite its contributions, this study has several limitations. First, the research was conducted only among Grade X students at MAN 2 Kota Kediri, which may limit the generalizability of the findings to other educational contexts. Second, the study relied primarily on self-reported questionnaire data, making the results susceptible to subjective perceptions and response bias. Third, only three external variables were included in the model, whereas other factors such as learning motivation, self-efficacy, academic ability, peer influence, and learning discipline may also contribute to self-regulated learning. Future research is therefore recommended to involve broader samples, adopt mixed-method approaches, and incorporate both internal and external determinants to obtain a more comprehensive understanding of students' learning independence.

Overall, this study demonstrates that digital teaching modules, school facilities, and parental support collectively play a significant role in enhancing students' self-regulated learning. The primary contribution of this research lies in its integration of technological, institutional, and familial factors within a single empirical model, thereby providing a more holistic understanding of the determinants of learning independence in the digital education era.

CONCLUSION

This study aimed to examine the influence of digital teaching modules, school facilities, and parental support on the self-regulated learning of Grade X students at MAN 2 Kota Kediri. The findings revealed that all three independent variables had positive and significant effects on students' self-regulated learning, both individually and simultaneously. These results indicate that the effective utilization of digital teaching modules, the availability of adequate school facilities, and strong parental support contribute substantially to the development of students' learning independence. Among the variables examined, school facilities emerged as the most influential factor, followed by digital teaching modules and parental support.

The findings successfully addressed the research objectives by demonstrating that digital teaching modules, school facilities, and parental support are important external determinants of students' self-regulated learning. This study confirms that learning independence is not solely shaped by individual characteristics but is also influenced by supportive learning environments that encompass technological resources, educational infrastructure, and family involvement. Consequently, students' ability to manage and direct their learning processes is strengthened when these external supports are available and effectively utilized.

From a theoretical perspective, this study contributes to the literature on self-regulated learning by integrating three external determinants into a single analytical framework. This comprehensive approach provides a broader understanding of how technological, institutional, and familial factors interact in supporting students' learning independence. From a practical perspective, the findings offer valuable insights for educational institutions in designing strategies to enhance self-regulated learning through the

optimization of digital learning resources, improvement of school facilities, and strengthening of parental engagement in students' educational activities.

The implications of this study suggest that fostering self-regulated learning requires collaborative efforts among schools, families, and educational technology providers. Schools are encouraged to continuously improve the quality and accessibility of digital teaching modules, maintain supportive learning facilities, and establish effective communication with parents. At the same time, parents should provide consistent motivation, supervision, and emotional support to help students develop responsibility, discipline, and sustainable learning habits.

Despite its contributions, this study has several limitations. The research was conducted within a single educational institution and focused exclusively on Grade X students, which may limit the generalizability of the findings. Future studies are therefore recommended to involve broader populations, different educational levels, and additional variables that may influence self-regulated learning, such as learning motivation, digital literacy, academic discipline, or social environment factors. Such efforts would provide a more comprehensive understanding of the determinants of students' learning independence in contemporary educational settings.

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