

NAVIGATING THE AI DISRUPTION: HOW DIGITAL LITERACY AND ARTIFICIAL INTELLIGENCE COMPETENCY DIRECT STUDENT CIVIC DISPOSITION

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ABSTRACT

This research investigates the influence of digital literacy on the civic disposition of students, with the use of AI as a moderating variable. The study employs an explanatory survey design. An online Likert-scale questionnaire was used to gather data from students in the Information Technology Study Program at Universitas Tidar who took the Citizenship Education course. The instrument has been tested for validity and reliability through a pilot study. Linear regression and moderation regression were used to evaluate the data. The findings suggest that digital literacy had a significant and positive effect on civic disposition, explaining 60.8% of its variance, while the use of AI has not been proven to significantly moderate the relationship. However, when positioned as an independent variable, AI usage actually has a direct and substantial impact on civic disposition, with the combined model explaining 73.2% of its variance. These findings imply that the formation of students' civic disposition in the periode of AI disruption requires strengthening digital literacy alongside the capacity to utilize AI critically and responsibly as two complementary competencies.

ABSTRAK

Penelitian ini menguji pengaruh literasi digital terhadap civic disposition mahasiswa, dengan penggunaan AI sebagai variabel moderasi. Penelitian menggunakan desain survei eksplanatori. Data dikumpulkan melalui kuesioner skala Likert daring kepada mahasiswa Prodi Teknologi Informasi Universitas Tidar yang menempuh mata kuliah Pendidikan Kewarganegaraan berjumlah 65 orang. Instrumen penelitian telah diuji validitas dan reliabilitasnya melalui tahap pilot study sebelum digunakan pada sampel utama. Analisis regresi linear sederhana dan regresi moderasi digunakan dalam penelitian ini. Temuan dari penelitian menunjukkan literasi digital secara signifikan dan positif berpengaruh terhadap civic disposition mahasiswa, literasi digital menjelaskan 60,8% variasi civic disposition. Namun, penggunaan AI tidak terbukti memoderasi secara signifikan hubungan antara literasi digital dan civic disposition. Temuan menarik lainnya menunjukkan bahwa penggunaan AI justru berpengaruh secara langsung dan signifikan terhadap civic disposition ketika diposisikan sebagai variabel independen, dengan model gabungan literasi digital dan penggunaan AI menjelaskan 73,2% variasi civic disposition. Penelitian ini memberikan implikasi bahwa pembentukan civic disposition mahasiswa di era disrupsi AI memerlukan penguatan literasi digital sekaligus pembekalan kemampuan menggunakan AI secara kritis dan bertanggung jawab sebagai dua kompetensi yang saling melengkapi.

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INTRODUCTION

The development of digital technology including the use of Artificial Intelligence (AI) makes it easier for people to access information, communicate, and participate in public spaces, including for students. This transformation brings both opportunities and serious challenges. Students can access information quickly and learning is more adaptive (Tan et al., 2025). On the other hand, students can also fall into the problems of disinformation, filter bubbles, and shifting civil participation norms that can affect civic disposition (Kops et al., 2025). Several previous studies related to digital literacy and civic engagement revealed various results. Bessong et al. (2024) in their research found a positive relationship between the level of digital literacy and civic engagement. Research subjects who have better digital literacy tend to be more active in community activities and are better able to verify information before acting. Research by Tarsidi et al. (2023) shows that the use of social media has a significant role in increasing research subjects' awareness of public issues and facilitating their engagement in online participation even though it also raises concerns related to the credibility of information. Research by Marten & Stadtler (2025) writes that interventions through information evaluation trainings led by educators significantly improve the ability of students to evaluate the credibility of information and reduce the level of vulnerability to misinformation. Saud et al. (2023) stated that local digital culture, infrastructure, and networks affect the form and depth of youth participation in civil society life. Several studies have been conducted showing that students build the concept of digital citizenship through digital literacy practices on social media that can affect participation in their political life (Gu et al., 2023).

Empirical studies in various contexts found evidence of a positive relationship between digital literacy and forms of civic engagement, including the ability to recognize valid information, think critically about online content, and participate constructively in public discourse (Bessong et al., 2024; Fajri et al., 2022; Iskandar et al., 2025). Artificial Intelligence (AI) accelerates information production and modifies the information ecosystem. Global trends show that young people see AI as a tool that can be used to support education. Students use AI to understand course material, help with coursework, and speed up access to information needed in learning (Chan & Hu, 2023). However, the use of AI in lectures also has a negative impact, namely concerns related to privacy risks, bias, and misinformation. Therefore, understanding students' digital literacy in the context of the AI era is very important to protect and strengthen civic disposition. Previous research shows that the level of digital literacy of students in Indonesia still varies and is affected by factors of access, infrastructure, and educational interventions (Kurniawati & Baroroh, 2016; Simanjuntak et al., 2025). In addition, the study of civics education based on local wisdom emphasizes the importance of contextualizing national values in citizenship education to strengthen student civic disposition (Novitasari et al., 2025).

Based on the reviews of these previous studies, several research gaps can be identified which form the basis of the novelty of this study. First, the majority of previous research focuses on the context of adult education/vocational learners, junior high school students, or cross-country studies, while this study specifically targets Universitas Tidar students as a population that has not been widely studied in digital literacy and citizenship issues. Second, in terms of the dependent variable, previous studies generally measure civic engagement or civic participation as a form of active involvement, whereas this study measures civic disposition, namely civic attitudes and dispositions, which is a more fundamental and less quantitatively explored in relation to digital literacy. Third, this study adds the dimension of AI disruption as a new variable that has not been addressed by previous studies, even though

the current development of AI technology has the potential to affect the way the students access, verify, and respond to information in the realm of citizenship. This study is theoretically important as it contribute to the enrichment of the literature on the relationship between digital literacy and civic disposition in the AI era and can practically be a reference for learning policies, campus digital literacy programs, and disinformation mitigation strategies for strengthening national character.

Based on previous research, student engagement in the public sphere can be considered relatively high, as demonstrated, for example, through activities such as clicking, sharing, and commenting on political issues on social media. However, such engagement may be assumed to reflect students' civic disposition maturity, which serves as the basis for their actions. Students' civic engagement through integration into the MBKM program has been shown to be effective in enhancing collaborative and leadership skills; however, the strengthening of civic values and ethics is likely to occur when intentional character development is provided to support such engagement, rather than relying solely on active participation (Hodriani et al., 2025). A high level of engagement does not automatically correspond to a mature civic disposition (Mazid et al., 2026). The ongoing pressures of globalization and digitalization have further exacerbated this situation, encouraging a shift in national values, such as mutual cooperation and respect for others, toward increasingly individualistic and egocentric orientations (Nababan et al., 2025). The increasingly intense flow of globalization, when not accompanied by character strengthening, may pose a risk to the decline of the moral quality of society, including among university students (Bila et al., 2023). Therefore, strengthening students' civic dispositions cannot occur naturally through civic engagement alone; it requires the intentional integration of values (Syahwaliana et al., 2025). Evidence from prior research revealing a gap between high levels of digital participation and a lack of commensurate maturity in students' civic dispositions makes research in this area urgent, particularly given the disruptive influence of AI, which threatens to widen this gap.

The preceding discussion of the background and research gap serves as the basis for formulating two research questions: (1) does digital literacy significantly influence the civic disposition of students, specifically those in the Information Technology undergraduate program at Universitas Tidar? and (2) does AI usage moderate the influence of digital literacy on students' civic disposition? Based on these questions, the study hypothesizes that digital literacy has a significant influence on students' civic disposition (H11) and that AI usage significantly moderates the influence of digital literacy on students' civic disposition (H12). Thus, this study aims to analyze the impact of digital literacy on the civic disposition of Universitas Tidar students and to examine the role of AI usage as a moderating variable in this relationship. The findings are expected to contribute theoretically to the study of digital literacy and citizenship in the era of AI disruption, as well as practically to the formulation of instructional policies and the strengthening of students' civic character.

METHOD

1. Research Approach and Design

This study used a quantitative approach with an explanatory survey design that is correlational-causal in nature, employing a moderating regression model. The aim was not merely to describe the phenomenon but to explain and test the hypothesized effect relationships among variables, namely the effect of digital literacy on civic disposition, with AI use as a moderating variable.

2. Stages/Implementation Procedures

The research was conducted through eight stages. The first stage was problem identification, based on observations of digital technology and AI use among Universitas Tidar students in learning and social media activities, supported by findings that generative AI use in education positively affects critical thinking, creative problem solving, and digital literacy (Wu & Zhang, 2025). The second stage was a literature study examining national and Scopus-indexed journals on digital literacy, civic disposition, digital citizenship, and AI disruption in education, which identified research gaps and the complex relationship between digital literacy and AI literacy (Jenkins & Torres-Zapata, 2025; Zhang et al., 2026). The third stage was the formulation of research questions and hypotheses (H_{01} , H_{11} , H_{02} , H_{12}). The fourth stage was the development of research instruments in the form of Likert-scale questionnaires based on a validated digital literacy framework (Chang & Kuo, 2025). The fifth stage was validity and reliability testing of the instrument through a pilot study, using corrected item-total correlation and factor analysis, and Cronbach's Alpha (Chang & Kuo, 2025; Ventivani et al., 2024; Wang et al., 2025). The sixth stage was data collection from the main sample. The seventh stage was data analysis, including descriptive statistics, classical assumption tests, and hypothesis testing using regression and moderated regression analysis (Warlim et al., 2026; Zeng et al., 2025). The eighth stage was interpretation of results and conclusion drawing based on statistical significance and effect size.

3. Time and Place of Research

Data collection was conducted in the Even Semester of the 2025/2026 Academic Year, which took place from February to June 2026 at Universitas Tidar.

4. Research Objects/Subjects/Participants and Sampling Techniques

The research involved two samples. The pilot study sample consisted of 40 undergraduate students from the English Language Education Study Program (S1 PBI) taking the Citizenship Education course, selected using purposive sampling. The main research sample consisted of 65 undergraduate students from the Information Technology Study Program (S1 TIF) taking the Citizenship Education course, selected using the total sampling technique.

5. Data Collection Techniques, Research Grids, and Instruments

Data were collected through an online survey using a Likert-scale questionnaire (1-5 scale) distributed via Google Form. The instrument was developed based on a validated digital literacy framework covering dimensions such as access and understanding, evaluation, digital ethics, collaboration, problem solving, and civic involvement (Chang & Kuo, 2025). The questionnaire was administered anonymously, and the instructions clearly stated that the responses would not affect the participants' academic assessment in the courses they were taking. This approach was intended to maintain confidentiality and reduce the potential for social desirability bias. It measured three variables: digital literacy (independent variable: information evaluation, digital ethics, digital security), civic disposition (dependent variable: responsibility, tolerance, social concern, commitment to Pancasila values), and AI use (moderating variable: intensity, purpose of use, ethical awareness).

Table 1. Research Instrument Blueprint

Variable	Dimension	Indicator	Number of Items	Item Numbers
Digital Literacy (Independent Variable)	Accessing and Searching for Information	Ability to access, search for, and find relevant and credible digital information	4	1–4
	Information Evaluation and Critical Thinking	Ability to evaluate the accuracy, credibility, and bias of digital information before using it	4	5–8
	Digital Ethics and Communication	Ability to communicate, collaborate, and act courteously and responsibly during digital interactions	8	9–16
	Digital Security	Ability to protect personal data, recognize privacy risks, and maintain personal safety during digital activities	4	17–20
AI Use (Moderating Variable)	Intensity, Purpose, and Ethical Awareness of AI Use	Frequency of AI usage, purpose of use (learning, completing assignments, and seeking information), and ethical awareness in utilizing AI	4	21–24
Civic Disposition (Dependent Variable)	Civic Responsibility	Willingness to consistently exercise the rights and fulfill the obligations of citizenship	4	25–28
	Tolerance and Democratic Attitudes	Willingness to respect the differing opinions, beliefs, and backgrounds of others, and to uphold democratic principles	8	29–36
	Social Concern	Sensitivity and concern regarding social issues in the local community	4	37–40
	Nationalism and Pancasila Values	Commitment to the values of Pancasila and a sense of patriotism	4	41–44
	Digital Civic Behavior	Willingness to behave responsibly, ethically, and constructively as a citizen in the digital spaces	4	45–48
Total			48	1-48

6. Data Validation

Instrument validity was tested using corrected item-total correlation (coefficients ranging from 0.497 to 0.920) and factor analysis, while reliability was tested using Cronbach's Alpha (threshold > 0.6, with reported scores ranging from 0.747 to 0.877 indicating high reliability) (Chang & Kuo, 2025; Ventivani et al., 2024; Wang et al., 2025). Only valid and reliable items were retained for the main data collection.

7. Data Analysis

Data were analyzed in stages: descriptive statistics to profile digital literacy, civic disposition, and AI use; classical assumption tests (normality, linearity, homoscedasticity, multicollinearity); simple linear regression to test H1₁; and moderated regression analysis to test H1₂, in line with approaches used in similar studies to examine context-dependent relationships (Warlim et al., 2026; Zeng et al., 2025). The researchers transformed the two independent variables before constructing the interaction term between digital literacy and AI use. The transformation was performed using a mean-centering procedure, in which each raw score was subtracted from its sample mean, with the aim of reducing the risk of severe multicollinearity arising from the multiplication of variables in the moderation regression model. Hypothesis decisions were based on p-value (<0.05) and path coefficients, processed using statistical software SPSS version 26.

RESULTS AND DISCUSSION

1. Validity and Reliability Tests on Pilot Study

The validity and reliability test of research instruments in the pilot study group were 40 respondents from undergraduate students of English Language Education (S1 PBI) study program using a questionnaire. The questionnaire consisted of three variables, namely digital literacy as an independent variable, the use of AI as a moderation variable, and civic disposition as a dependent variable. The interpretation categories used were $\alpha \geq 0.90$ = highly reliable; 0.80-0.89 = reliable; 0.70-0.79 = moderately reliable; 0.60-0.69 = accepted (minimum threshold). Pilot study data (n=40, PBI undergraduate students) that had been collected through questionnaires were tested using Cronbach's Alpha that the three variables as a whole have met the reliability requirements ($\alpha > 0.60$).

The instrument validity test was carried out using the corrected item-total correlation technique using the Pearson Product Moment correlation formula, which correlates the score of each item with the total score of the other items in one variable. Items are declared valid if the r-count value is greater than the r-table at a significance level of 5%. The r-table is calculated as 0.312 (n=40, df=38, $\alpha=5\%$ two-tailed). The item validity calculation criteria is declared valid if it has r-count > r-table. Based on the results of the validity test, 42 of the 48 items (87.5%) were declared valid and 6 items were invalid because r-count < r-table. Invalid items are item number 8,9,10,12 (Digital literacy variables), item number 24 (AI usage variable), and item number 30 (Civic disposition variable). The researchers then revised the six items before they were distributed to the primary sample. The primary sample of this study were undergraduate students of Information Technology (S1 TIF) with a total of 65 (n=65, undergraduate students of TIF).

2. Validity and Reliability Test on the Primary Sample

After revising the six statement items in the research instrument based on the test results of the pilot study group, the researchers used a revised version of the research instrument questionnaire which was distributed to the primary sample of 65 undergraduate Information Technology study program students (n=65, S1 TIF). Calculation of r-table for n=65 (df=63, $\alpha=5\%$, two-tailed) = 0.244. The item validity calculation criterion is that each item is declared valid if the r-count > 0.244. The results of the validity test on 48 statement items in the questionnaire as a research instrument showed that all items were declared valid (r-count > 0.244). Then, a reliability test was carried out using Cronbach's Alpha with the instrument criteria declared reliable if the Alpha value was greater than 0.60. The results showed that all variables had a Cronbach's Alpha value above 0.60, with the Civic

Disposition variable showing the highest reliability (0.949) and the AI Usage variable showing the lowest reliability but still above the minimum threshold (0.746).

3. Classical Assumption Test on Primary Sample

The classical assumption test was carried out to test the data normality, linearity between the independent variable and the dependent variable, namely Digital Literacy (LD) on Civic Disposition (CD) and between moderation variables, namely the use of AI (AI) on CD and testing multicollinearity and heteroscedasticity. The results of the classical assumption test can be seen in the following table.

Table 2. Normality Test

Test	Statistics	p-value	Conclusion
Shapiro-Wilk	0.979	0.323	Normal ($p > 0.05$)
Kolmogorov-Smirnov	0.117	0.313	Normal ($p > 0.05$)

Source: Research Results (2026)

Samples with a size less than 50 ($n < 50$) can use the Shapiro-Wilk test, while samples greater than or equal to 50 ($n \geq 50$) can use the Kolmogorov-Smirnov test (Ahadi & Zain, 2023; Ghasemi & Zahediasl, 2012). The primary sample in this study consists of 65, where the normality test used was Shapiro-Wilk and Kolmogorov-Smirnov to obtain complete data. In Table 2, it can be seen that both using the Shapiro-Wilk test and the Kolmogorov-Smirnov test, the $p\text{-value} > 0.05$, indicating that the residual data follows a normal distribution and further tests can be conducted.

Table 3. Linearity Test Table

Relationship	r (Pearson)	p-value	Conclusion
Digital Literacy → Civic Disposition	0.779	< 0.001	Linear, significant
Use of AI → Civic Disposition	0.707	< 0.001	Linear, significant

Source: Research Results (2026)

The researcher used Pearson Product Moment correlation to see the linear relationship and its significance between the independent variable and the dependent variable. In addition, the data in this study used an interval scale (Likert-scale), so the Pearson Product Moment correlation is appropriate. Pearson correlation is commonly used to measure the strength and direction of the linear relationship between two variables in quantitative research where the data uses a scale or ratio (Patimah et al., 2025). If the p-value obtained is < 0.05 , the relationship between the independent variable and the dependent variable is called significant, meaning that the relationship is not due to chance but is real, and vice versa. The value of r (Pearson correlation coefficient) that approaches +1 or -1 indicates that the relationship is becoming stronger towards positive (+1) or negative (-1). Based on Table 3, it can be stated that DL has a linear, significant, and strong relationship with CD, as indicated by the value of $r = 0.779$ (approaching +1) and $p < 0.001$ (less than 0.05).

Table 4. Multicollinearity and Heteroscedasticity Test

Variable	VIF	t (Glejser)	p-value (Glejser)
Digital Literacy	1.372	1.841	0.070
Use of AI	1.372	-1.312	0.194

Source: Research Results (2026)

The next test conducted by the researchers is the multicollinearity and heteroscedasticity test. The multicollinearity test is used to determine whether the

independent variables have a high correlation with each other or not, because if there is too strong a relationship, it will be difficult to separate their individual effects on the dependent variable accurately (Asrat et al., 2025). The researchers conduct the multicollinearity test using the VIF (variance inflation factor). If the VIF value is greater than 10 ($VIF > 10$), it indicates the presence of multicollinearity, and vice versa (Wibowo, 2025). Based on table 4, it can be seen that the VIF values for both DL and AI usage are below 10 ($VIF < 10$), indicating the absence of multicollinearity. Then, the heteroscedasticity test (Glejser) is used to determine the constant/stable nature of the residual variance (error) across the values of the independent variable. If it is not constant, the regression coefficient estimates cannot be trusted (Wardhana & Iba, 2024). In the Glejser test, the variance is indicated to be constant if it has a significance value greater than 0.05 ($p\text{-value} > 0.05$) and vice versa (Firdausya & Indawati, 2023). Table 4 shows that the p -value for DL (0.070) and AI usage (0.194) are both greater than 0.05 ($p\text{-value} > 0.05$), indicating that heteroscedasticity does not occur. The t -value (Glejser) for AI usage is -1.312, which means that the residual values tend to decrease as AI usage increases. Nevertheless, since the p -value for AI usage is $0.194 > 0.05$, it can be stated that this effect is not significant, there is no issue of heteroscedasticity. Based on the results of normality, linearity, multicollinearity and heteroscedasticity tests, it can be seen that the data meets the requirements of normality, linearity, no multicollinearity ($VIF < 10$), and no heteroscedasticity ($p > 0.05$), so the data is feasible for further analysis using linear regression.

4. Hypothesis Test on Primary Sample

Hypothesis testing on the primary sample ($n=65$, S1 TIF study program students) used regression analysis conducted through two stages in accordance with the two hypotheses tested. To test $H1_1$, digital literacy has a significant effect on the civic disposition of Universitas Tidar students in the era of AI disruption, carried out using simple linear regression. Then to test $H1_2$, the use of AI to significantly moderate the effect of digital literacy on student civic disposition, carried out using moderation regression (Moderated Regression Analysis/MRA) using a hierarchical regression approach with a difference test of R^2 (ΔR^2). Broadly speaking, the testing of the $H1_1$ hypothesis was carried out using simple linear regression analysis, while the $H1$ hypothesis was carried out using a Moderated Regression Analysis with a hierarchical regression approach, namely comparing the model with and without interaction rates, and testing the significance of changes in R^2 (ΔR^2) using the F test. The results of hypothesis testing can be seen in the following table.

Table 5. Model 1-Simple Linear Regression (Digital Literacy $\rightarrow$ Civic Disposition)

Variable	B	SE	t	p-value
Constant	17.587	8.606	2.044	0.045
Digital Literacy	0.998	0.101	9.877	<0.001
Note: $R^2 = 0.608$ Adjusted $R^2 = 0.601$ $F = 97.544$ $p < 0.001$				

Source: Research Results (2026)

In Table 5, there are several mentions in the simple linear regression test Model 1 (DL on CD). The general equation used is $Y = a + bX$ (Fatmawati & Lubis, 2020). Y is CD as the dependent variable. X is DL as the independent variable. The value of a is a constant that can be seen in column B (Unstandardized Coefficients), showing a value of 17.587. The value of b is the coefficient of DL listed in column B (Unstandardized Coefficients), showing a value of 0.998.

The B value (unstandardized regression coefficient) is a value that indicates how much civic disposition changes for each increase of 1 unit in digital literacy, assuming other variables are constant. Based on the results of the equation, it can be said that if the digital literacy value is 0 (zero), then the civic disposition value is 17.587. Based on the data in the table showing the B value of digital literacy as 0.998, civic disposition can be predicted to increase by 0.998 points for each 1 point increase in the digital literacy score. Then the SE (Standard Error) value obtained from the calculations using SPSS shows the precision estimation of the B coefficient. SE is needed to calculate the t value using the formula $t = B : SE$ (Sudariana & Yoedan, 2021). Then, based on the t value, a p-value will be obtained that will be used to make a decision on whether to accept or reject the hypothesis. The hypothesis will be accepted if the p-value < 0.05 , indicating that the effect is significant (Ghozali, 2006; Yusuf et al., 2024). In Table 5, it can be seen that the p-value of digital literacy is 0.001, so p-value < 0.05 , which means that $H1_1$ is accepted, indicating that digital literacy has a significant effect on civic disposition. Additionally, the coefficient of determination (R^2) has a value of 0.608, which means that digital literacy can explain 60.8% of the variation in students' civic disposition, while the remaining 39.2% is explained by factors other than digital literacy. The coefficient of determination measures the extent of variation in the model that explains the dependent variable (Ghozali, 2006; Wardhana & Iba, 2024). Then the Adjusted R^2 shows a value of 0.601, meaning that although R^2 has been corrected, digital literacy is still able to accurately explain 60.1% of the variation in civic disposition. The R^2 version is corrected or referred to as Adjusted R^2 to anticipate false increases, thus avoiding the possibility that added independent variables do not genuinely contribute (Ghozali, 2006). The F test value is observed. The F value indicates the overall significance of the model, but cannot be separated from the p value. The larger the F value and the significance of the p-value < 0.05 , the more the independent variable has a significant effect on the dependent variable (Bella et al., 2024). Based on table 5, digital literacy has a significant influence on civic disposition.

Table 6. Model 2-Multiple Regression (Digital Literacy + Use of AI $\rightarrow$ Civic Disposition)

Variable	B	SE	t	p-value
Constant	7.245	7.426	0.976	0.333
Digital Literacy	0.723	0.099	7.328	< 0.001
Use of AI	2.010	0.375	5.360	< 0.001
Note: $R^2 = 0.732$ Adjusted $R^2 = 0.723$ $F = 84.609$ $p < 0.001$				

Source: Research Results (2026)

Table 6 presents the multiple regression test data for Model 2 (digital literacy + AI use on civic disposition). The data shows that digital literacy and AI use together have an influence on civic disposition, with R^2 and Adjusted R^2 values being higher than in Model 1, which only used digital literacy, as well as a high F value (84.609) and a p-value < 0.001 .

Table 7. Model 3-Moderate Regression (Digital Literacy $\times$ Use of AI $\rightarrow$ Civic Disposition)

Variable	B	SE	t	p-value
Constant	102.334	0.826	123.886	< 0.001
Digital Literacy (Centered)	0.658	0.113	5.819	< 0.001
Use of AI (Centered)	1.957	0.377	5.196	< 0.001
DL $\times$ AI Usage	-0.022	0.019	-1.167	0.248
Note: $R^2 = 0.738$ Adjusted $R^2 = 0.725$ $\Delta R^2 = 0.006$ F-change = 1.362 $p = 0.248$				

Source: Research Results (2026)

Table 7 shows the test data on the moderating effect of using AI as a moderating variable, whether it strengthens or weakens the influence of digital literacy on civic disposition or does not moderate. The moderating effect test in this study used Moderated Regression Analysis (MRA) which employs the formula of the equation $Y = a + b_1X + b_2M + b_3XM$ (Nugroho, 2012). Y in this study is civic disposition. Value a is a constant. Value b_1 is the regression coefficient of digital literacy. Value b_2 is the regression coefficient of AI usage. Value b_3 is the regression coefficient of the product variable of digital literacy and AI usage (interaction term). Before multiplication, centering was performed on digital literacy and AI usage to reduce multicollinearity. Based on Table 7, it can be seen that the coefficient for the interaction term of digital literacy and AI usage is -0.022 and the p-value is 0.248 ($p > 0.05$), indicating that the effect of digital literacy on civic disposition is not significantly moderated by AI usage. The presence of the interaction term between AI usage and digital literacy only increases R^2 by 0.006 or 0.6%, which is statistically interpreted as an insignificant moderation effect.

Table 8. Summary of Hypothesis Results

Hypothesis	Results	Decision
H1 ₁ : Digital literacy → Civic disposition	$\beta = 0.998$, $p < 0.001$	H1 ₁ supported there is a significant and positive effect
H1 ₂ : Use of AI moderates the effect of Digital Literacy on Civic Disposition	$\Delta R^2 = 0.006$ $p = 0.248$	H1 ₂ not supported the moderation effect is insignificant

Source: Research Results (2026)

The summary of the hypothesis testing results in this study can be seen in Table 8. Hypothesis H1₁, which states that digital literacy has a significant effect on civic disposition, is accepted. Meanwhile, H1₂ is rejected, indicating that the use of AI does not moderate the effect of digital literacy on civic disposition.

5. The Effect of Digital Literacy on Civic Disposition

The results of hypothesis testing showed that digital literacy had a significant and positive effect on the civic disposition of students of the Information Technology Study Program of Universitas Tidar, with digital literacy being able to explain 60.8% of civic disposition variations. These findings confirm that the higher the ability of students to access, evaluate, and use digital information ethically and safely, the higher the character of citizenship possessed and reflected in a sense of responsibility, tolerance, social care, nationalism, and responsible digital behavior.

These findings are consistent with studies showing that digital literacy has become a core competency in working, learning, and communicating, including the ability to access, evaluate, create, and communicate information safely and responsibly (Li et al., 2025). This ability is a prerequisite for the formation of a mature citizenship character in the digital space. Other studies in the context of civic education also confirm that digital media, when used with intentional pedagogical design, can significantly increase civic awareness, ethical reasoning, and active involvement of students (Mohamed & Hermansyah, 2024). In addition, the subdimensions that show the highest reliability and validity on the civic disposition variable, namely tolerance and democratic attitudes and digital behavior of civilians, indicate that students with good digital literacy tend to be more open to differences in views and more consistently maintain ethics in interactions in the digital space. Strong digital literacy can enhance students' ability to assess news on social media

more objectively, reducing bias due to motivated reasoning (tendency to trust information that is in line with personal views) (Kahne & Bowyer, 2017).

6. Use of AI as a Moderation Variable

The results of the moderation regression test showed that the interaction effect between digital literacy and the use of AI on civic disposition was not statistically significant. The use of AI has not been shown to strengthen or weaken the relationship between digital literacy and civic disposition in the primary research sample. Based on these findings, although H1₂ is not supported, the findings can be interpreted as follows. First, the relationship between digital literacy and civic disposition in Information Technology study program students is classified as strong and stable, so it is not easily disturbed by variations in the intensity of individual AI use. Digital literacy has become internalized as an independent basic competency of certain patterns of AI technology use. Second, the use of AI has the possibility of working through a different pathway than hypothesized, namely as a mediator or independent predictor rather than a moderator. A similar pattern was found in AI literacy research among health students, which showed that AI literacy significantly decreased technostress and increased positive attitudes towards digital technology, with technostress acting as a partial mediator in the relationship (Lee et al., 2025). Thus, the effect of literacy from the use of AI on an attitude often works through intermediate variables, not as a reinforcement of the relationship between two other variables that already exist. Third, in terms of educational practice, recent studies in AI-based learning in the social science field show that when students are left to use AI tools without a clear structure, the learning outcomes obtained actually decrease so that the guardrails guided by educators become an important determinant of the success of AI integration (Bastani et al., 2025; Kestin et al., 2025). Without a structured AI use framework in the context of Civic Education courses in the field, variations in the way students use AI tend to be heterogeneous to produce consistent and statistically detectable moderation effects.

7. Repositioning the Use of AI as a Second Independent Variable

Although not proven as a moderator, the results of multiple regression (Model 2) show that the use of AI has a significant and positive direct effect on civic disposition. When digital literacy and the use of AI were included together as two independent predictors, the model was able to explain 73.2% of the civic disposition variation increased by 12.4 percent compared to the model involving only one independent variable, digital literacy.

The findings indicate that the use of AI is more appropriately positioned as the second independent variable that contributes directly to civic disposition, rather than as a variable that changes the strength of the relationship between digital literacy and civic disposition. This position is supported by the results of previous studies which show that critical involvement with AI is part of civic competence itself, not just a tool for supporting digital literacy (Heafner & Maxwell, 2025). The ability of students to be critical of the use of AI which includes understanding the limitations and possible biases within, is a form of citizenship competence so it cannot simply be viewed as a technical ability in the use of digital media (Heafner & Maxwell, 2025). This view reinforces the findings of this study that the use of AI has its own path of impact on civic disposition.

In practical terms, the results of this study indicate that students who use AI responsibly, including verifying AI answers, understanding the limitations of accuracy, and not relying on it raw, have a tendency to show a higher civic disposition, regardless of the

previous level of general digital literacy. This reinforces the urgency of curriculum development that explicitly integrates ethical and critical AI literacy as a stand-alone component, in line with the recommendation that the use of AI in learning must be intentionally aligned with curricular objectives and disciplinary learning outcomes, not treated as complementary or novel (Heafner & Maxwell, 2025).

8. Research Implications

This study enriches the conceptual framework on the relationship between digital literacy and civic disposition by showing that the role of AI in the context of this study is more accurately understood as a direct predictor, not a moderator. The results of this study open up space for further research to examine whether the use of AI acts as a mediator in the relationship between digital literacy and civic disposition.

For Universitas Tidar, this finding can become the foundation for policy and curriculum considerations in the Civic Education course, in particular it can support the following points. First, strengthening integrated digital literacy learning, since it is proven to be the main predictor of students' civic disposition. Second, developing ethical and critical AI use learning modules in an explicit and structured manner, considering that the use of AI is proven to contribute independently to civic disposition. Third, considering the integration of both competencies (digital literacy and AI literacy) in parallel, instead of treating one as a prerequisite or reinforcement for the other.

CONCLUSION

This study aims to examine the effect of digital literacy on civic disposition of students of the Information Technology Study Program, Universitas Tidar, with the use of AI as a moderation variable. Based on the results of data processing from 65 respondents, some conclusions can be drawn as follows.

First, digital literacy was found to have a significant and positive effect on student civic disposition. Students who have a better ability to access, evaluate, and use digital information ethically tend to show a more mature citizenship character, both in terms of social responsibility, tolerance of differences, and concern for surrounding issues. The results of this study strengthen the research hypothesis that digital competence is not just a technical skill, but also forms the character of a person's citizenship in the digital era.

Second, the use of AI was not found to strengthen or weaken the relationship between digital literacy and civic disposition. This means that how often or how wisely students use AI does not change the power of the effect of digital literacy on the character of their citizenship. The results of this study are different from the initial hypothesis, but it actually opens new findings that the use of responsible AI is proven to have its own effect directly on civic disposition, regardless of the digital literacy possessed by students. In other words, AI is more appropriate to be seen as a stand-alone factor in shaping citizenship character, not just a factor that affects the strength and weakness impact of digital literacy.

Third, the results of this study illustrate that the efforts to form student civic disposition should not only focus on strengthening digital literacy, but also need to include debriefing the ability to use AI critically and responsibly as a separate, equally important part. These two competencies complement each other, but work through different paths in shaping students' civic attitudes.

Overall, this study emphasizes that in the midst of the rapid development of digital technology and artificial intelligence, student citizenship development requires a

comprehensive approach so that it is not enough to rely on only one type of competence, but it is necessary to combine digital literacy and proficiency in using AI in tandem in the educational process, especially through the Civic Education course at universities.

Based on this study, for researchers who intend to conduct similar studies or are interested in investigating civic disposition and AI, several recommendations are proposed. First, future research is encouraged to examine potential mediating variables, such as trust or ethical awareness in AI use, to better understand the mechanisms underlying their role as direct predictors of civic disposition. Future studies should also consider expanding the sample across different study programs and higher education institutions to enhance the generalizability of the findings. Longitudinal designs and mixed-methods approaches should also be considered to address the limitations associated with the cross-sectional design and self-reported data used in the present study. In addition, AI literacy can be examined as a distinct construct separate from general digital literacy, as the findings of this study suggest that it may play a more specific role in shaping students' civic disposition in the era of AI disruption.

DECLARATIONS

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Conceptualization: NN and FAI; Methodology: NN and FAI; Formal Analysis: NN and FAI; Investigation: MS; Writing—Original Draft Preparation: NN and FAI; Writing—Review and Editing: ANW; Visualization: ANW; Funding Acquisition: NN and MS. All authors have read and agree to the final published version of the manuscript.

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All authors have no conflict of interest in the data collection, writing of the article, or publication.

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REFERENCES

- Ahadi, G. D., & Zain, N. N. L. E. (2023). Pemeriksaan Uji Kenormalan dengan Kolmogorov-Smirnov, Anderson-Darling dan Shapiro-Wilk. *Eigen Mathematics Journal*, 6(1), 11–19. <https://doi.org/10.29303/emj.v6i1.131>
- Asrat, C. A., Makkulau, & Yahya, I. (2025). Perbandingan Metode Principal Component Analysis (PCA) dan Partial Least Square (PLS) dalam Penanganan Multikolinearitas pada Kasus Kemiskinan di Provinsi Sulawesi Tenggara Tahun 2023. *Arus Jurnal Sains Dan Teknologi*, 3(1), 68–82. <https://doi.org/10.57250/ajst.v3i1.1164>
- Bastani, H., Bastani, O., Sungu, A., Ge, H., Kabakçı, Ö., & Mariman, R. (2025). Generative AI without Guardrails Can Harm Learning: Evidence from High School mathematics. *Proceedings of the National Academy of Sciences*, 122(26). <https://doi.org/10.1073/pnas.2422633122>
- Bella, J. E., Maramis, J. B., & Rumokoy, L. J. (2024). Pengaruh Dividend Payout Ratio, Debt to Equity Ratio, dan Firm Size Terhadap Keputusan Share Repurchase Pada Perusahaan Nideks Kompas100 Yang Terdaftar di Bei. *Jurnal EMBA*, 12(4), 237–249. <https://doi.org/10.35794/emba.v12i4.58799>
- Bessong, C. D., Ewuru, A. A., Bessong, N. O., Omang, T. N., Olori, G. I., Patrick, E. O., Olofu, A. P., & Olori, C. N. (2024). Digital Literacy and Its Effect on Learners' Civic Engagement in Adult and Vocational Education in Nigeria. *Masyarakat, Kebudayaan Dan Politik*, 37(4), 418–431. <https://doi.org/10.20473/mkp.V37I42024.418-431>
- Bila, N. S., Wahyuni, F. D., & Nurgiansah, T. H. (2023). Peran Penting Civics: Pendidikan Ilmu Kewarganegaraan di Era Masyarakat Digital. *Jurnal Kewarganegaraan*, 20(1), 1–12. <https://doi.org/10.24114/jk.v20i1.39530>
- Chan, C. K. Y., & Hu, W. (2023). Students' Voices on Generative AI: Perceptions, Benefits, and Challenges in Higher Education. *International Journal of Educational Technology in Higher Education*, 20(1), 43. <https://doi.org/10.1186/s41239-023-00411-8>
- Chang, C.-Y., & Kuo, H.-C. (2025). The Development and Validation of the Digital Literacy Questionnaire and the Evaluation of Students' Digital Literacy. *Education and Information Technologies*, 30(9), 11549–11581. <https://doi.org/10.1007/s10639-024-13216-7>
- Fajri, I., Budimansyah, D., & Komalasari, K. (2022). Digital Citizenship In Civic Education Learning: A Systematic Literature Review. *Jurnal Ilmiah Peuradeun*, 10(3), 833–854. <https://doi.org/10.26811/peuradeun.v10i3.755>
- Fatmawati, & Lubis, A. S. (2020). Pengaruh Perilaku Kewirausahaan Terhadap Kemampuan Manajerial Pada Pedagang Pakaian Pusat Pasar Kota Medan. *Jurnal Muhammadiyah Manajemen Bisnis*, 1(1), 1–10. <https://doi.org/10.24853/jmmb.1.1.1-10>
- Firdausya, F. A., & Indawati, R. (2023). Perbandingan Uji Glejser dan Uji Park dalam Mendeteksi Heteroskedastisitas Pada Angka Kematian Ibu di Provinsi Jawa Timur Tahun 2020. *Jurnal Ners*, 7(1), 793–796. <https://doi.org/10.31004/jn.v7i1.14069>
- Ghasemi, A., & Zahediasl, S. (2012). Normality Tests for Statistical Analysis: A Guide for Non-Statisticians. *International Journal of Endocrinology and Metabolism*, 10(2), 486–489. <https://doi.org/10.5812/ijem.3505>
- Ghozali, I. (2006). *Aplikasi Analisis Multivariate dengan Program SPSS*. Badan penerbit universitas Diponegoro Semarang.

- Gu, M. M., Huang, C. F., & Lee, C.-K. K. J. (2023). Investigating University Students' Digital Citizenship Development through the Lens of Digital Literacy Practice: A Translingual and Transemiotizing perspective. *Linguistics and Education*, 77(July), 101226. <https://doi.org/10.1016/j.linged.2023.101226>
- Heafner, T., & Maxwell, D. (2025). CIVIC: Five Pillars for Using Artificial Intelligence in Social Studies Education. *Contemporary Issues in Technology and Teacher Education*, 25(4), 648–686. <https://www.learntechlib.org/p/224971/>
- Hodriani, Pinem, W., Sutrisno, Safitri, I., & Bahauddin, N. A. binti B. (2025). Integrating Civic Engagement to Foster Soft Skills and Teacher Professionalism. *Jurnal Kewarganegaraan*, 22(2), 228–245. <https://doi.org/10.24114/jk.v22i2.66124>
- Iskandar, R., Maksum, A., & Marini, A. (2025). Digital Citizenship Literacy in Indonesia: The Role of Privacy Awareness and Social Campaigns. *Social Sciences & Humanities Open*, 12, 101697. <https://doi.org/10.1016/j.ssaho.2025.101697>
- Jenkins, A. I. S., & Torres-Zapata, Á. E. (2025). Design and Validation of an Instrument to Assess Social and Civic Competencies in Secondary School Students. *Journal of Cultural Analysis and Social Change*, 392–399. <https://doi.org/10.64753/jcasc.v10i3.2423>
- Kahne, J., & Bowyer, B. (2017). Educating for Democracy in a Partisan Age. *American Educational Research Journal*, 54(1), 3–34. <https://doi.org/10.3102/0002831216679817>
- Kestin, G., Miller, K., Klales, A., Milbourne, T., & Ponti, G. (2025). AI Tutoring Outperforms In-class Active Learning: An RCT Introducing a Novel Research-based Design in an Authentic Educational Setting. *Scientific Reports*, 15(1), 17458. <https://doi.org/10.1038/s41598-025-97652-6>
- Kops, M., Schittenhelm, C., & Wachs, S. (2025). Young People and False Information: A Scoping Review of Responses, Influential Factors, Consequences, and Prevention Programs. *Computers in Human Behavior*, 169, 108650. <https://doi.org/10.1016/j.chb.2025.108650>
- Kurniawati, J., & Baroroh, S. (2016). Literasi Media Digital Mahasiswa Universitas Muhammadiyah Bengkulu. *Jurnal Komunikator*, 8(2), 51–66. <https://journal.umy.ac.id/index.php/jkm/article/view/2069>
- Lee, J. Y., Min, Y. H., Yim, J., Park, K. H., & Yune, S. J. (2025). Mediating Effect of Technostress on the Relationship Between Artificial Intelligence Literacy and Attitude Toward Digital Technology among Health Professions Students: A Structural Equation Modeling Approach. *Journal of Yeungnam Medical Science*, 43(7). <https://doi.org/10.12701/jyms.2026.43.7>
- Li, F., Cheng, L., Wang, X., Shen, L., Ma, Y., & Islam, A. Y. M. A. (2025). The Causal Relationship between Digital Literacy and Students' Academic Achievement: a Meta-Analysis. *Humanities and Social Sciences Communications*, 12(1), 1–12. <https://doi.org/10.1057/s41599-025-04399-6>
- Marten, P. L., & Stadler, M. (2025). Building Resilience Against Online Misinformation: A Teacher-led Training Promoting Evaluation Strategies among Lower Secondary Students. *Computers in Human Behavior*, 165, 108548. <https://doi.org/10.1016/j.chb.2024.108548>
- Mazid, S., Wulansari, A., Komalasari, K., Abdulkarim, A., Rahmat, Indah Sari, B., & Wulanjani, A. N. (2026). Exploring the Existence of Civic Dispositions in Junior High School Students: A Preliminary Study in Civic Education. *Jurnal Kewarganegaraan*, 23(1), 31–47. <https://doi.org/10.24114/jk.v23i1.65737>

- Mohamed, S., & Hermansyah, S. (2024). The Role of Digital Media in Developing Civic Literacy Among High School Students in the Era of Social Transformation. *SMART: Journal of Multidisciplinary Educational*, 2(2), 97–107. <https://doi.org/10.61677/smart.v2i2.592>
- Nababan, R., Dharma, S., Siahaan, P. G., Junaidi, Fatimah, U., & Faudzi, W. S. D. bin M. (2025). Transforming Civic Education Through Nationalism Projects to Strengthen Global Diversity Character in Higher Education. *Jurnal Kewarganegaraan*, 22(2), 160–179. <https://doi.org/10.24114/jk.v22i2.65623>
- Novitasari, N., Syahroni, M., Sukron Mazid, Firda Aulia Izzati, & Arum Nisma Wulanjani. (2025). Civics Education Learning Based on Local Cultural Values to Strengthen Students' Civic Disposition. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 10(3), 171–179. <https://doi.org/10.25217/ji.v10i3.6672>
- Nugroho, A. W. (2012). Pengujian Efek Moderasi Melalui Analisis Regresi Berganda. *Jurnal Pengukuran Psikologi Dan Pendidikan Indonesia*, 1(4), 229–242.
- Patimah, Zulpan, Dite Umbara Alfansuri, El Munawaroh, & Muhammad Ilyas. (2025). Memahami dan Menerapkan Uji Korelasi dalam Analisis Data Penelitian Pendidikan. *Journal Education Innovation (JEI)*, 3(4), 740–752. <https://doi.org/10.65474/f7vd8y11>
- Saud, M., Ida, R., Mashud, M., Yousaf, F. N., & Ashfaq, A. (2023). Cultural Dynamics of Digital Space: Democracy, Civic Engagement and Youth Participation in Virtual Spheres. *International Journal of Intercultural Relations*, 97, 101904. <https://doi.org/10.1016/j.ijintrel.2023.101904>
- Simanjuntak, E., Mulya, H. C., Engry, A., & Alfian, I. N. (2025). Dataset of Digital Literacy of University Students in Indonesia. *Data in Brief*, 58, 111227. <https://doi.org/10.1016/j.dib.2024.111227>
- Sudariana, N., & Yoedan. (2021). Analisis Statistik Regresi Linier Berganda. *Seniman Transaction*, 2(2). <https://seniman.nusaputra.ac.id/index.php/seniman/article/view/40>
- Syahwaliana, K., Habib, T. A., Shofiyah, S. N. A., & Oki, S. (2025). Integrasi Nilai Pancasila dalam Pembentukan Civic Disposition Melalui Pendidikan Pancasila: Systematic Literature Review. *Jurnal Kewarganegaraan*, 22(1), 76–88. <https://doi.org/10.24114/jk.v22i1.64360>
- Tan, L. Y., Hu, S., Yeo, D. J., & Cheong, K. H. (2025). Artificial Intelligence-enabled Adaptive Learning Platforms: A Review. *Computers and Education: Artificial Intelligence*, 9, 100429. <https://doi.org/10.1016/j.caeai.2025.100429>
- Tarsidi, D. Z., Suryadi, K., Budimansyah, D., & Rahmat, R. (2023). Social Media Usage and Civic Engagement among Indonesian Digital Natives: An Analysis. *Jurnal Civics: Media Kajian Kewarganegaraan*, 20(2), 257–269. <https://doi.org/10.21831/jc.v20i2.60812>
- Ventivani, A., Muyassaroh, L. U., Laksana Sakti, K. F., Farhan Masrur, M., & M, K. (2024). A Measuring Tool for Assessing Digital Literacy Competence among Mandarin Language Students. *International Journal of Engineering Trends and Technology*, 72(10), 336–343. <https://doi.org/10.14445/22315381/IJEIT-V72I10P132>
- Wang, X., Zhang, C., Qi, Y., Xing, Y., Liu, Y., Sun, J., & Luan, W. (2025). Digital Health Literacy Questionnaire for Older Adults: Instrument Development and Validation Study. *Journal of Medical Internet Research*, 27, e64193. <https://doi.org/10.2196/64193>
- Wardhana, A., & Iba, Z. (2024). Analisis Regresi & Analisis Jalur Untuk Riset Bisnis Menggunakan SPSS 29.0 & SMART-PLS 4.0. Eureka Media Aksara.
- Warlim, W., Effendi, R., Fitria, R., Ibrahim, M. M., & Hadiati, D. N. (2026). Cross-faculty

- Analysis of AI-enhanced Civic Character Education on Digital Citizenship Development. *Frontiers in Education*, 10, 1690799. <https://doi.org/10.3389/feduc.2025.1690799>
- Wibowo, S. A. (2025). Penggunaan EViews dalam Pengujian Data Panel untuk Penelitian Akuntansi: Pendekatan Konseptual dan Aplikatif. *Reviu Akuntansi Dan Bisnis Indonesia*, 9(1), 174–186. <https://doi.org/10.18196/rabin.v9i1.26898>
- Wu, D., & Zhang, J. (2025). Generative Artificial Intelligence in Secondary Education: Applications and Effects on Students' Innovation Skills and Digital Literacy. *PLOS One*, 20(5), e0323349. <https://doi.org/10.1371/journal.pone.0323349>
- Yusuf, M. A., Herman, T., Abraham, A., & Rukmana, H. (2024). Analisis Regresi Linier Sederhana dan Berganda Beserta Penerapannya. *Journal on Education*, 6(02), 13331–13344. <https://jurnal.cahaya publikasi.com/index.php/jcn/article/view/29>
- Zeng, Q., Huang, X., Zhu, J., Su, S., Hu, Y., & Zhang, X. (2025). Mechanisms of Nurses' AI Use Intention Formation in Sichuan, Yunnan, and Beijing, China: Mediating Effects of AI Literacy Via Self-efficacy-to-attitude Pathways. *Frontiers in Public Health*, 13, 1622802. <https://doi.org/10.3389/fpubh.2025.1622802>
- Zhang, C. (Xinyi), Rice, R. E., & Wang, L. H. (2026). College Students' Literacy, ChatGPT Activities, Educational Outcomes, and Trust from a Digital Divide perspective. *New Media & Society*, 28(2), 673–695. <https://doi.org/10.1177/14614448241301741>