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The Contribution of ChatGPT, Digital Literacy, and Economic Literacy to The Study Outcomes of Economic Education Students Mediated by Self-Efficacy

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Abstract
Technological progress requires the presence of intelligent economic people, able to create income, make wise economic decisions, and improve the welfare of life. Economic education that is responsive to technological developments is able to provide more relevant learning experiences. The success of current economic education students who are digital natives can be influenced by various aspects, such as the contribution of ChatGPT, digital literacy, economic literacy, and self-efficacy. This research aims to determine the influence of the contribution of ChatGPT, digital literacy, and economic literacy to study results which are mediated by the self-efficacy of economic education students. The research method uses a Structural Equation Model (SEM) approach based on Partial Least Square (PLS) via the SmartPLS application version 3.3.9. The research results show that economic literacy has a large and effective contribution in increasing student self-efficacy and study results compared to the use of ChatGPT and digital literacy. There is still room for improvement to optimize the implementation of ChatGPT and strengthen digital literacy in achieving good study results.

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INTRODUCTION

Education is the main pillar in forming a young generation who is competent and able to face global challenges. Along with the development of information and communication technology in

the digital era, a fundamental transformation has occurred in the world of education (Wijaya & Pandin, 2022). Technological progress demands the presence of intelligent economic people, able to create income, make wise economic decisions, and improve welfare (Darmawan et al., 2023). Economic education that is responsive to technological developments is able to provide more relevant learning experiences (Ferdian et al., 2022). Economic education helps students develop analytical, critical and problem-solving skills that are much needed in facing the challenges of the modern world (Ferdian et al., 2022; Soroko, 2023; Watung et al., 2022). Understanding economic concepts also provides a basis for students to develop entrepreneurial thinking, encourage innovation, and create business opportunities (Pratiwi, 2022). Therefore, economic education has a strategic role in realizing the quality of education in Indonesia.

However, Indonesia's current level of educational progress is still lagging behind neighboring countries, especially when compared with countries throughout the world (Abeng, 2023). There are still challenges and room for improvement in the Indonesian education system to be able to compete globally. In the 2023 World Top 20 Education Poll ranking, there are 20 countries that occupy the top positions, while Indonesia is ranked 67th out of a total of 203 countries assessed (Worldtop20.org, 2023). Improving the quality of education requires collaboration between the government, the minister of education, educators, parents, the community and students themselves (Isroani & Huda, 2022). Holistic and comprehensive education can create a learning environment that supports the growth and development of the nation's young generation. Universities as formal institutions that educate the nation's generations can be a strategic step for the government to achieve educational goals, namely to make the nation's life smarter by forming quality students (Helda & Syahrani, 2022; Maryanti et al., 2020).

To see to what extent this education has succeeded in forming quality students, it can be seen from the results of their studies (Dicker et al., 2019; Selvaraj et al., 2021). Study results not only reflect student achievement, but can also be a marker of the overall success of an education system (Lin et al., 2020). This evaluation is the key to getting a clearer picture of the ability of economic education students to understand and apply economic concepts in real life. The success of current economic education students who are digital natives can be influenced by various aspects. ChatGPT as personalized learning is able to support improving student study outcomes such as asking questions at any time and receiving feedback quickly, helping them overcome learning obstacles and deepen their understanding of concepts (Limo et al., 2023). Digital literacy helps students become better prepared to face the demands of the digital era, they can optimize their learning experience and improve the quality of their study results (Rahmatullah et al., 2022). Apart from that, economic literacy has a significant positive impact on the study results of economic education students (Swiecka et al., 2020). When students have a good level of economic literacy, they tend to understand economic concepts in more depth.

The challenges for economics education students are not only limited to understanding economic concepts, but also involve the integration of technological developments in the learning process. Understanding economic concepts is the main foundation in preparing students to understand and face dynamic changes in the economic world (Bowles & Carlin, 2020). The use of technology such as ChatGPT has emerged as an innovative solution to support the personalization of student learning (Elbanna & Armstrong, 2024). Indonesia is among the top five countries and is ranked fourth in global user contribution.

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Fig 1. Top Countries of ChatGPT Users (Similarweb, 2023)

The importance of a positive attitude to optimize the potential of technology in economic learning becomes more significant when considering students' digital literacy levels (Nikou & Aavakare, 2021). Digital literacy has become a major focus due to its increasingly important role in understanding and managing digital information. Understanding digital literacy does not only include technical skills, but also involves critical abilities to understand, evaluate, and use digital information effectively (Falloon, 2020). Digital literacy prepares economic education students to face dynamic changes in an increasingly digitalized economic world (Dvorakova & Polents, 2021; Rosário Cabrita, 2020).

In this context, the importance of students' economic literacy level cannot be ignored (Efendi et al., 2019; Kurowski, 2021; Wagner, 2019). Economic literacy is a key element that supports the development of a deep understanding of economic education students' learning (Compen et al., 2019). Economic education students need to not only master economic theory, but also have the ability to apply these concepts in real world contexts (Sutaphan & Yuenyong, 2019). Therefore, how the use of ChatGPT (AI), increasing digital literacy, and economic literacy interact with each other is a central question in the dynamics of economic education that continues to develop.

In the process, an important role is also played by the self-efficacy of economic education students (Wardana et al., 2020). Self-efficacy is defined as an individual's belief in his or her ability to produce desired behavior or achieve certain goals (Alnoor et al., 2020). Students with a high level of self-efficacy tend to be more motivated to deal with complex and abstract economic learning material, handle assignments, and find creative solutions to the economic problems they face (Eladl & Polpol, 2020).

Piaget's constructivist theory emphasizes that knowledge is constructed through an individual's interaction with their environment and experiences (Kudelová, 2020). In the context of economic education, technologies such as ChatGPT, digital literacy, and economic literacy serve as tools that support the knowledge construction process for students by providing interactive and personalized learning experiences (Imran et al., 2024). Furthermore, self-efficacy — or the confidence in one's ability to complete academic tasks — acts as a mediator that connects the use of technology and literacy with students' academic performance. High self-efficacy can enhance motivation and engagement in learning, which ultimately has a positive impact on students' academic outcomes (Meng & Zhang, 2023; Ramos Salazar & Hayward, 2018). Therefore,

integrating technology into constructivist-based learning and strengthening self-efficacy can improve the effectiveness of learning outcomes for economic education students.

This research aims to analyze and explain the relationship between the contribution of ChatGPT (AI) in the field of economic education, digital literacy, and economic literacy to the study results of economic education students, by considering self-efficacy as a mediating variable. Although there have been many previous studies that have revealed the role of ChatGPT in various scientific fields, none has specifically revealed its contribution in the context of economic education (Imran & Almusharraf, 2023; Mhlanga, 2023; Yu, 2023). Therefore, it is hoped that the research results will open up insights, fill knowledge gaps, and help develop more adaptive and effective economic learning strategies at the tertiary level, ensuring that students can face the complexities of the modern economy with a strong understanding and relevant skills.

METHODS

An In The type of research used is explanatory research. Explanatory research aims to connect different but related patterns and produce causal patterns (Buchanan & Seligman, 1995). The aim of this research is to determine the influence of the role of ChatGPT (AI) as personalization of learning, the level of digital literacy, and the level of economic literacy of economic education students on study results mediated by self-efficacy. This research uses a Structural Equation Model (SEM) approach based on Partial Least Square (PLS) via the SmartPLS application version 3.3.9. SEM analysis is used to analyze the pattern of relationships between variables with the aim of whether there is an influence between a set of exogenous variables on endogenous variables (Hair et al., 2021). By utilizing this analysis technique, research can be more in-depth in uncovering the complex relationships between the variables studied, namely ChatGPT (X1), Digital Literacy (X2), Economic Literacy (X3), Study Results (Y), and Self Efficacy (Z).

The population in this study were students from the 2021 and 2022 undergraduate economic education study program from the State University of Malang and the State University of Surabaya. The total research population was 312 students. The sampling technique in this research used proportional random sampling. The sample calculation used a sample size calculator with an error rate of 5% and a confidence level of 95% so that the number of samples selected for this study was 173 students. Calculation of the research sample using a sample size calculator can be seen in the following image.

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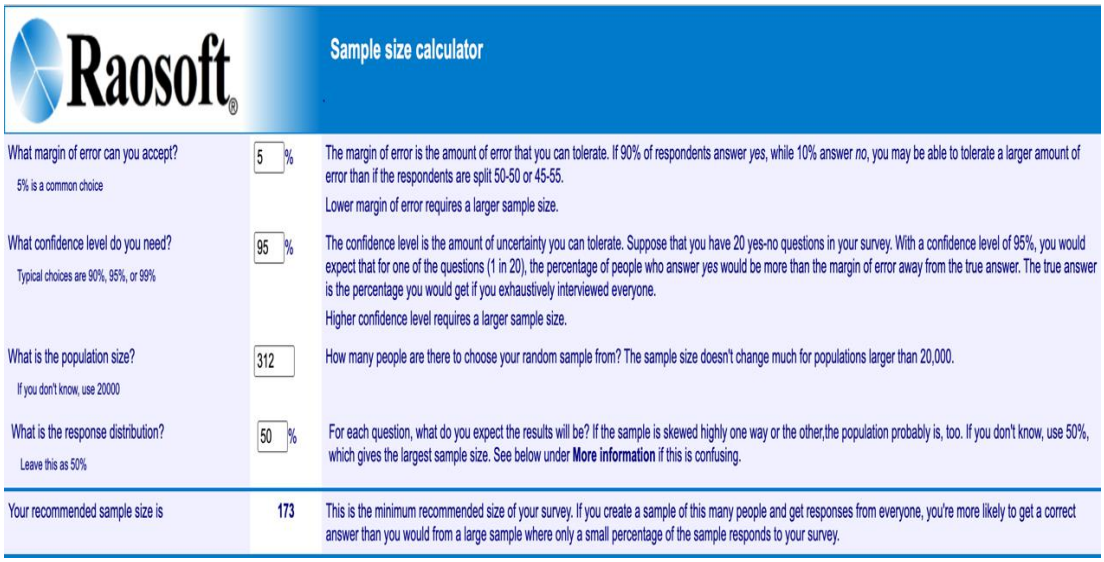

Fig 2. Sample Calculation

The primary data for this research comes from students from the 2021 and 2022 Economic Education Undergraduate Study Program at Malang State University and Surabaya State University who have filled out questionnaires related to research variables, namely ChatGPT, Digital Literacy, Economic Literacy, Study Results, and Self-efficacy. For secondary data, it was obtained from UAS scores in the Science and Skills Courses (MKK) of the Bachelor of Economics Education Study Program which includes Monetary Economics, Entrepreneurship, and Banks and Non-Bank Financial Institutions (BLKBB) as supporting data for student study results variables.

This research will use a closed questionnaire with available answer options, presented online via Google Form. Respondents will provide answers by marking the appropriate options, focusing on the use of ChatGPT in learning (X1), digital literacy (X2), economic literacy (X3), self-efficacy (Z), and study results (Y). The following is a grid of the instruments used in this research.

Table 1. Research Instrument Grid

Variable	Indicator	Items	No. Items
ChatGPT (Chan & Hu, 2023).	ChatGPT AI Technology Knowledge	Knowledge of ChatGPT contributions	1
		Knowledge of ChatGPT limitations	2
	Participation in Economic Learning	Willingness to use ChatGPT	3
		Readiness to utilize ChatGPT	4
	Quality of Interaction	Personalizing Economic Learning	5
		Usefulness	6
		Dependency	7
Digital Literacy (Rodríguez-De-dios et al.,	ICT Skills	Technology Skills	8

2016)			
		Communication Skills	9
		Information Skills	10
	Critical Skills	Analytical Ability	11
	Security Skills	Ability to Cope with Risks and Dangers	12
Economic Literacy (Soroko, 2023)	Critical Economic Literacy Knowledge	Understanding Basic Economic Concepts	13, 14, 15, 16
		Knowledge of global economic issues	17, 18, 19
	Critical Economic Literacy Skills	Economic decision making skills	20
		Ability to manage finances	21
Study Results (Bloom, 1956; Cheng & Yang, 2023)	Cognitive Domain	Knowledge and understanding of economic material	22
		Learning evaluation capabilities	23
	Affective Domain	*Creative*	24
		Critical Thinking	25
		Communications	26
		Collaboration	27
	Psychomotor Domain	Budgeting skills	28
		Savings and investment management	29, 30
		Consumer decision making	31
***Self-efficacy*(Sariani et al., 2021)**	Confidence in Facing Uncertain Situations	Confidence in the ability to overcome uncertainty	32
	Beliefs Drive Motivation and Cognitive Ability	Ability to regulate self-motivation	33
		Skills mobilize cognitive abilities	34
	Confidence in Achieving Targets and Overcoming Problems	Ability to overcome obstacles or problems in achieving goals	35

The instrument that has been developed will be tested on 30 respondents using SPSS version 25. The following are the results of the research validity test.

Table 2. Recapitulation of Validity Test Results

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
GPT1	22.3429	10,879	,662	,673
GPT2	22.3429	11,526	,412	,721
GPT3	22.7714	10,829	,511	,699
GPT4	22.8286	9,852	,612	,671
GPT5	22.5714	11,429	,492	,705
GPT6	22.5143	11,198	,462	,710
GPT7	22.6857	12,516	,518	,787
LD8	16.2286	6,005	,706	,762
LD9	15.8857	5,928	,636	,780
LD10	16.1143	5,869	,694	,763
LD11	16.3429	6,291	,593	,793
LD12	16,0000	6,412	,467	,832
LE13	31,8000	22,165	,759	,893
LE14	31.7714	22,299	,762	,893
LE15	31.6286	22,417	,651	,901
LE16	31,8000	21,459	,874	,885
LE17	31,8000	22,753	,667	,900
LE18	32.0286	22,676	,607	,904
LE19	32.0571	23,585	,448	,917
LE20	31.8571	21,303	,766	,892
LE21	31.4286	23,193	,725	,897
HS22	36.1143	28,398	,575	,919
HS23	36.0286	28,617	,694	,913
HS24	35.8857	27,398	,763	,909
HS25	36,0000	26,706	,797	,906
HS26	36.2857	27,445	,702	,912
HS27	35.8286	27,087	,776	,908
HS28	36.0286	27,558	,701	,912
HS29	36.1429	26,303	,758	,909
HS30	36.1429	28,008	,649	,915
HS31	35,8000	28,635	,591	,918
SE32	12.2000	4,341	,825	,833
SE33	11.9714	4,264	,765	,853
SE34	12.0571	4,055	,750	,861
SE35	12.2000	4,518	,695	,879

The results of the validity test indicate that the measurement instruments used in this research can be considered normal or have an adequate level of validity. The Item Corrected value for each item in the ChatGPT scale, Digital Literacy, Economic Literacy, Study Results, and Self-efficacy is greater than the threshold of 0.3. This criterion indicates that each item has a significant correlation with the total scale and consistently makes a positive contribution to the dimensions measured by the scale. This instrument shows good ability in measuring the constructs studied, and the results of

the validity test provide confidence regarding the reliability and consistency of the instrument for measuring the variables ChatGPT, Digital Literacy, Economic Literacy, Study Results, and Self-efficacy. Next, measuring the validity test, along with a table of research reliability test results.

Table 3. Recapitulation of Reliability Test Results

Items	Cronbach's Alpha	N of Items
ChatGPT (X1)	,742	7
Digital Literacy (X2)	,822	5
Economic Literacy (X3)	,908	9
Study Results (Y)	,920	10
Self-efficacy (Z)	,889	4

The results of the reliability test show that the measurement instrument used in this research has an adequate level of reliability. Reliability criteria are expressed in Cronbach's Alpha values, and all research scales, including chatGPT, digital literacy, economic literacy, study results, and self-efficacy, meet reliability standards with values above the threshold of 0.6. These results indicate that all measurement instruments have a high level of internal consistency and reliability, so they can be relied on to measure the constructs examined in this study.

RESULT AND DISCUSSION

Descriptive Statistical Analysis

The results of this variable description reflect answer data from 173 students who are currently taking the Bachelor of Economics Education program at Malang State University and Surabaya State University class of 2021 and 2022. The variables examined in this research include ChatGPT (X1), Digital Literacy (X2), Economic Literacy (X3), Self-efficacy (Z), and Study Results (Y). Descriptive analysis was carried out by looking at the frequency distribution of the average value of student responses to the questions in the questionnaire that had been distributed.

Table. 4 results of descriptive statistical analysis

Variable	Sub Variable	Indicator	Mean
ChatGPT	ChatGPT AI Technology Knowledge	GPT1	4.34
		GPT2	4.35
	Participation in Economic Learning	GPT3	4.09
		GPT4	4.11
	Quality of Interaction	GPT5	4.18
		GPT6	4.13
		GPT7	4.27
Digital Literacy	ICT Skills	LD8	4.32
		LD9	4.55
		LD10	4.31
	Critical Skills	LD11	4.24
	Security Skills	LD12	4.35
Economic Literacy	Critical Economic Literacy Knowledge	LE13	4.39
		LE14	4.36

		LE15	4.35
		LE16	4.31
		LE17	4.24
		LE18	4.02
		LE19	3.94
	Critical Economic Literacy Skills	LE20	4.24
		LE21	4.45
Study Results	Cognitive Domain	HS22	4.24
		HS23	4.24
	Affective Domain	HS24	4.42
		HS25	4.40
		HS26	4.18
		HS27	4.40
	Psychomotor Domain	HS28	4.28
		HS29	4.18
		HS30	3.95
Self-efficacy	Confidence in Facing Uncertain Situations	SE32	4.29
	Beliefs Drive Motivation and Cognitive Ability	SE33	4.38
		SE34	4.23
	Confidence in Achieving Targets and Overcoming Problems	SE35	4.17

Based on the table above, it is known that in the ChatGPT variable the majority of respondents gave a high assessment of ChatGPT AI technology knowledge, participation in economic learning, and the quality of interactions with ChatGPT. This shows high acceptance and willingness to integrate it in learning activities. The use of ChatGPT in learning contexts has been well received, indicating potential for wider use in the future. Additionally, no respondent gave the lowest score for interaction quality on GPT5 and GPT6, indicating the satisfaction gained from using ChatGPT in the context of academic consulting. On the digital literacy variable, there were no respondents who gave the lowest scores for the ICT skills, critical skills and security skills subvariables. This indicates a high level of skill in these aspects, reflecting good awareness and understanding of information and communication technology (ICT), critical skills in evaluating digital information, as well as efforts to maintain security in the use of technology. The highest percentage of respondents who gave a score of 5 was found in the LD9 indicator, indicating confidence and skills in using various digital technology platforms to communicate. Although the majority gave high ratings, there was slight variation in responses, indicating that a small proportion of respondents also experienced difficulties in certain aspects of ICT skills.

Respondents' responses to economic literacy showed a positive perception of critical economic literacy knowledge and skills, with the majority scoring above 3 for knowledge and above 4 for skills. Although the majority demonstrate strong skills in applying economic concepts, the discrepancy between knowledge and skills highlights the need for increased conceptual understanding to support better decision making as well as more effective participation in economic discussions and analysis. Furthermore, the study results show that the majority of respondents have a good understanding of the material, a strong positive response to the affective domain, and a good

level of skill in the psychomotor domain. These positive responses reflect strong success in cognitive, affective, and psychomotor aspects, indicating that respondents generally have solid understanding, positive emotional responses, and good proficiency in applying physical skills related to the material being measured. Meanwhile, in the self-efficacy variable, the majority of respondents showed strong confidence in dealing with uncertain situations, motivating themselves, using cognitive abilities, achieving targets, and overcoming problems. They have solid confidence in facing uncertainty, and feel able to motivate themselves and overcome obstacles in achieving their academic goals. The results of this assessment reflect a positive and confident attitude in facing academic tasks.

Evaluation of the Measurement Model (Outer Model)

The results of research analysis use an outer model to evaluate the validity and reliability of the research model, which reveals the relationship between directly measured variables or measurement items and latent variables in the research. Validity evaluation includes convergent validity and discriminant validity, while reliability is measured using composite reliability, Cronbach's alpha, and HTMT. Evaluation of the research model produced the following findings.

1) Convergent Validity Testing (Convergent Validity)

Convergent validity in measurement model analysis can be demonstrated by the outer loading value. The validity of a measurement item can be confirmed if it has a coefficient greater than 0.50 and significance at the 5% level or t-statistic of 1.96 (Purwanto et al., 2021). The following is a table of outer loading values.

Table 5. Outer Loading Values I

Indicator	Loading Factor	Information
GPT1	0.830	Valid
GPT2	0.412	Invalid
GPT3	0.814	Valid
GPT4	0.836	Valid
GPT5	0.834	Valid
GPT6	0.715	Valid
GPT7	0.403	Invalid
HS22	0.760	Valid
HS23	0.736	Valid
HS24	0.833	Valid
HS25	0.813	Valid
HS26	0.792	Valid
HS27	0.779	Valid
HS28	0.769	Valid
HS29	0.714	Valid
HS30	0.563	Valid
HS31	0.688	Valid
LD10	0.816	Valid
LD11	0.799	Valid

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LD12	0.677	Valid
LD8	0.811	Valid
LD9	0.773	Valid
LE13	0.759	Valid
LE14	0.795	Valid
LE15	0.792	Valid
LE16	0.849	Valid
LE17	0.806	Valid
LE18	0.746	Valid
LE19	0.674	Valid
LE20	0.812	Valid
LE21	0.658	Valid
SE32	0.850	Valid
SE33	0.868	Valid
SE34	0.873	Valid
SE35	0.775	Valid

Loading factor values between 0.5 and 0.7 are considered valid, so it can be concluded that all indicators except GPT2 and GPT7 fall into the adequate validity category. From this table, most of the indicators in the factors studied have high outer loading values, indicating that they are valid in measuring the appropriate factors. The GPT2 and GPT7 indicators have loading factors below the range that is considered valid, namely GPT2 with a value of 0.412 and GPT7 with a value of 0.403. Indicators that have a low outer loading value indicate that they need to be eliminated and a second data processing should be carried out. Here is the second PLS processing model.

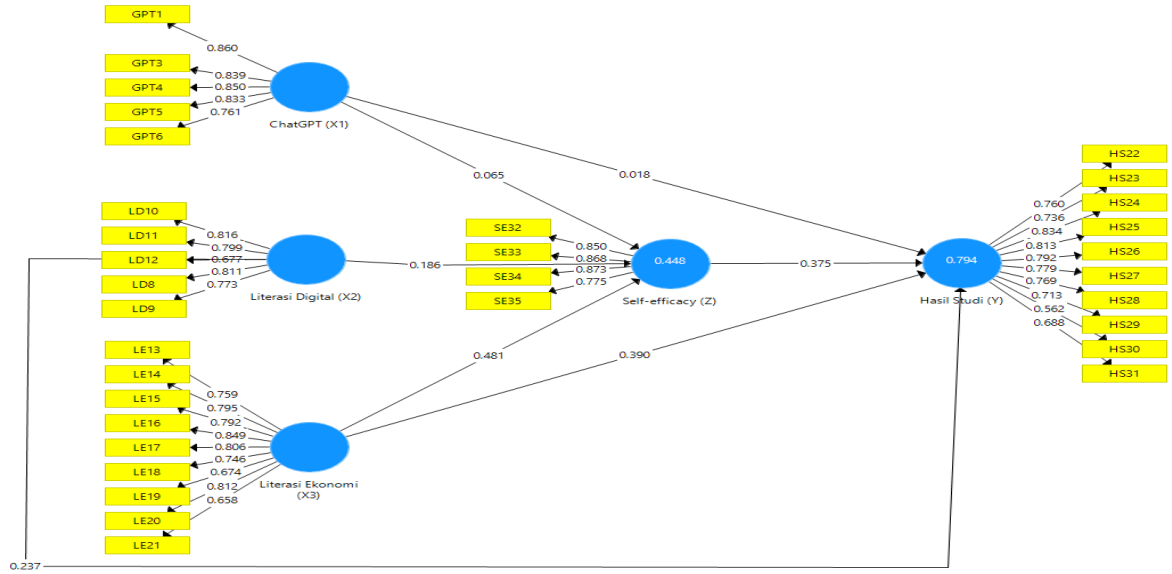

Fig 3. Results of Phase II Data Processing

Based on the second data analysis, it is shown that the outer loading value has a number greater than 0.50 and the t-statistic value exceeds 1.96. Therefore, it can be concluded that all items contained in this research variable have met the requirements for convergent validity.

Based on the second data analysis, after removing several invalid instruments, it can be concluded that the values of the above instruments have met the established criteria standard, which is greater than 0.50. The following table presents the outer loading values from the second measurement.

Tablel 6. Outer Loading Values II

Indicator	Factor Loading	t-statistic
GPT1	0.860	34.612
GPT3	0.839	30.413
GPT4	0.850	31.642
GPT5	0.833	28.441
GPT6	0.761	18.297
HS22	0.760	20.792
HS23	0.736	20.553
HS24	0.834	34.636
HS25	0.813	31.440
HS26	0.792	28.015
HS27	0.779	19.216
HS28	0.769	21.049
HS29	0.713	16.135
HS30	0.562	9.734
HS31	0.688	12.713
LD10	0.816	28.035
LD11	0.799	27.810
LD12	0.677	11.125
LD8	0.811	22.223
LD9	0.773	16.977
LE13	0.759	16.231
LE14	0.795	20.173
LE15	0.792	18.117
LE16	0.849	32.854
LE17	0.806	26.138
LE18	0.746	19.247
LE19	0.674	12.216
LE20	0.812	25.421
LE21	0.658	13.248
SE32	0.850	35.434
SE33	0.868	37.112
SE34	0.873	39.952
SE35	0.775	12.795

Based on the information presented in Table 11, it is shown that the outer loading values are greater than 0.50 and the t-statistic values exceed 1.96. Therefore, it can be concluded that all items within the research variables have met the requirements for convergent validity.

2) Discriminant Validity Testing

The analysis of the measurement model for discriminant validity can be evaluated using the HTMT (Heterotrait-Monotrait Ratio) value. The validity of a variable is considered acceptable if the HTMT value is below 0.90 (Hair et al., 2021). The following table shows the results of the discriminant validity measurement based on the Heterotrait-Monotrait Ratio.

Table 7. Results of Discriminant Validity Measurements

Variable	ChatGPT	Learning Outcomes	Digital Literacy	Economic Literacy	*Self-efficacy*
ChatGPT (X1)		0.570	0.720	0.565	0.480
Learning Outcomes (Y)	0.570		0.848	0.891	0.863
Digital Literacy (X2)	0.720	0.848		0.822	0.671
Economic Literacy (X3)	0.565	0.891	0.822		0.731
***Self-efficacy* (Z)**	0.480	0.863	0.671	0.731	

Table 7 shows that the HTMT values for all constructs in the study are below 0.90. This indicates that the indicators used in this study are distinct and not correlated with other indicators, thereby confirming the formation of latent variables. Therefore, it can be concluded that all constructs in this study meet the requirements for discriminant validity.

3) Reliability Testing

Reliability testing is used to evaluate the reliability of constructs or latent variables in a measurement model. Reliability evaluation is based on two criteria, namely the composite reliability value and Cronbach's alpha value. A latent variable is considered to have reliability if both composite reliability and Cronbach's alpha values exceed 0.70 (Hair et al., 2020). The results of reliability testing using SmartPLS version 3.3.9 can be seen in the following table.

Table 8. Reliability Test Results

Variable	*Cronbach's Alpha*	*Composite Reliability*
ChatGPT (X1)	0.887	0.917
Study Results (Y)	0.911	0.926
Digital Literacy (X2)	0.834	0.883
Economic Literacy (X3)	0.912	0.928
***Self-efficacy*(Z)**	0.863	0.907

The data listed in Table 13 shows that the composite reliability and Cronbach's alpha values of all latent variables in this study exceed 0.70. Therefore, it can be concluded that these variables meet reliability standards.

Structural Model Evaluation (Inner Model)

The results of research analysis using the inner model aim to assess how appropriate the model is in the context of the overall research. This inner model is formed from several variables

and related question items. The inner model evaluation process involves two processes, namely assessing the determinant coefficients and the relevance of predictions. The results of the research model evaluation produced the following findings.

1) R-squared (R2)

*R-squared*used to indicate how big an impact is produced by endogenous variables. Apart from that, R-squared also provides an overview of the strengths or weaknesses of a research model. When the R-squared value reaches 0.75, the model is considered strong, while a value of 0.50 indicates a moderate model, and a value of 0.25 indicates a weak model (Kang et al., 2020). The R-squared value can be seen in the following table.

Table 9. R-squared value

Variable	*R-squared*
Study Results (Y)	0.794
Self-efficacy(Z)	0.448

The Study Result Variable (Y) has an R-squared of 0.794. This indicates that approximately 79.4% of the variation in the Study Outcome variables can be explained by the endogenous variables observed in the research model. Based on the criteria above, this model is considered strong because the R-squared value exceeds 0.75. The variable Self-efficacy (Z) has an R-squared of 0.448. This shows that around 44.8% of the variation in the Self-efficacy variable can be explained by endogenous variables in the research model. This model is classified as moderate because the R-squared value is between 0.25 and 0.50.

2) Q-squared (Q2)

*Q-squared*used to evaluate how well the resulting observation values can predict the results of the research model. The range of Q-squared values is from 0 to 1. The criteria for assessing the strength of a model based on Q-squared are 0.35 (strong model), 0.15 (moderate model), and 0.02 (weak model) (UTAMI et al., 2021). The calculation of the Q-squared value in the research was carried out using the following formula.

$Q2 = 1 – (1 – R_{12}) (1 – R22)$
$Q2 = 1 – (1 – 0.448) (1 – 0.794)$
$Q2 = 0.886088$

The calculated value of Q-squared (Q2) is around 0.886088. This shows that approximately 88.6% of the variation in the resulting observed values can be explained or predicted by this research model. This research model is categorized as a very strong model. Thus, this research model has a high predictive level and is reliable in explaining the phenomenon under study. The variables used in the research model significantly contribute to the ability to predict the results of the research.

Hypothesis test

Hypothesis analysis aims to evaluate the impact of exogenous variables on endogenous variables. The hypothesis testing procedure aims to determine whether the hypothesis can be accepted or rejected. An indication of acceptance or rejection of the hypothesis is obtained through

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interpretation of the t-statistic and p-value. When the t-statistic value exceeds 1.96 and the p-value is less than 0.05, the relationship between variables is considered significant (Shaffer, 2019). This hypothesis testing was carried out using SmartPLS 3.3.9 software with the Bootstrapping method. The results of the hypothesis analysis are presented as follows.

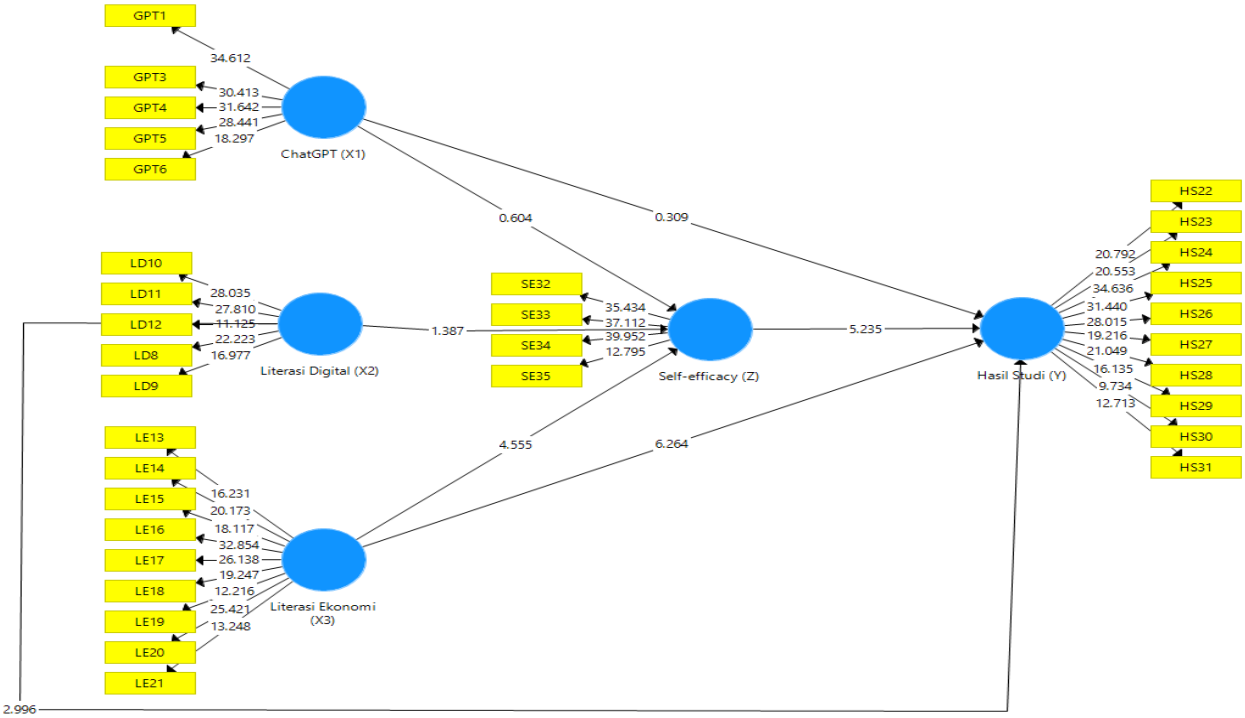

Fig 4. Bootstrapping results

Bootstrapping results can reveal the impact between variables as depicted in Figure 4. If the original sample shows a positive value, then the effect will tend to be positive, and vice versa. The results of this research hypothesis test are presented in the following table.

Table 10. Hypothesis Test Results

Variable	***Original Sample***	**t-statistics**	***p-values***	**Conclusion**
ChatGPT -> Study Results	0.018	0.309	0.757	Rejected
ChatGPT -> Self-efficacy	0.065	0.604	0.546	Rejected
Digital Literacy -> Study Results	0.237	2,996	0.003	Accepted
Digital Literacy -> Self-efficacy	0.186	1,387	0.166	Rejected
Economic Literacy -> Study Results	0.390	6,264	0,000	Accepted
Economic Literacy -> Self-efficacy	0.481	4,555	0,000	Accepted
Self-efficacy -> Study Results	0.375	5,235	0,000	Accepted
ChatGPT (X1) -> Self-efficacy (Z) -> Study Results (Y)	0.025	0.602	0.548	Rejected
Digital Literacy (X2) -> Self-efficacy (Z) -> Study Results (Y)	0.070	1,380	0.168	Rejected
Economic Literacy (X3) -> Self-efficacy (Z) -> Study Results (Y)	0.180	3,176	0.002	Accepted

a. H1: There is a positive and significant influence of ChatGPT's contribution to the self-efficacy of economics education students and is rejected. This is based on the original sample value of 0.065, the t-statistic value of 0.604, and the p value of 0.546. The original sample value shows a positive value. However, the t-statistic value is less than 1.96 and the p-value exceeds 0.05. Therefore, the relationship between variables is considered insignificant and rejected.
b. H2: There is a positive and significant influence on the contribution of digital literacy to the self-efficacy of economics education students and is rejected. This is based on the original sample value of 0.186, the t-statistic value of 1.387, and the p value of 0.166. The original sample value shows a positive value. However, the t-statistic value is less than 1.96 and the p-value exceeds 0.05. Therefore, the relationship between variables is considered insignificant and rejected.
c. H3: There is a positive and significant contribution of economic literacy to the self-efficacy of students receiving economic education. This is based on the original sample value of 0.481, the t-statistic value of 4.555, and the p value of 0.000. The original sample value shows a positive value. Furthermore, the t-statistic value exceeds 1.96 and the p-value is less than 0.05. Therefore, the relationship between variables is considered significant and accepted.
d. H4: There is a positive and significant influence of ChatGPT's contribution to the study results of economic education students and is rejected. This is based on the original sample value of 0.018, the t-statistic value of 0.309, and the p value of 0.757. The original sample value shows a positive value. However, the t-statistic value is less than 1.96 and the p-value exceeds 0.05. Therefore, the relationship between variables is considered insignificant and rejected.
e. H5: There is a positive and significant influence on the contribution of digital literacy to the results of economic education students receive. This is based on the original sample value of 0.237, the t-statistic value of 2.996, and the p value of 0.003. The original sample value shows a positive value. Furthermore, the t-statistic value exceeds 1.96 and the p-value is less than 0.05. Therefore, the relationship between variables is considered significant and accepted.
f. H6: There is a positive and significant influence on the contribution of economic literacy to the study results of economic education students receive. This is based on the original sample value of 0.390, the t-statistic value of 6.264, and the p value of 0.000. The original sample value shows a positive value. Furthermore, the t-statistic value exceeds 1.96 and the p-value is less than 0.05. Therefore, the relationship between variables is considered significant and accepted.
g. H7: There is a positive and significant influence of self-efficacy on the study results of economic education students receive. This is based on the original sample value of 0.375, the t-statistic value of 5.235, and the p value of 0.000. The original sample value shows a

positive value. Furthermore, the t-statistic value exceeds 1.96 and the p-value is less than 0.05. Therefore, the relationship between variables is considered significant and accepted.

h. H8: There is a positive and significant influence of ChatGPT's contribution to study results through the self-efficacy of economic education students being rejected. This is based on the original sample value of 0.025, the t-statistic value of 0.602, and the p value of 0.548. The original sample value shows a positive value. However, the t-statistic value is less than 1.96 and the p-value exceeds 0.05. Therefore, the relationship between variables is considered insignificant and rejected.

i. H9: There is a positive and significant influence on the contribution of digital literacy to study results through the self-efficacy of economic education students being rejected. This is based on the original sample value of 0.070, the t-statistic value of 1.380, and the p value of 0.168. The original sample value shows a positive value. However, the t-statistic value is less than 1.96 and the p-value exceeds 0.05. Therefore, the relationship between variables is considered insignificant and rejected.

j. H10: There is a positive and significant contribution of economic literacy to study results through the self-efficacy of economic education students receive. This is based on the original sample value of 0.180, the t-statistic value of 3.176, and the p value of 0.002. The original sample value shows a positive value. Furthermore, the t-statistic value exceeds 1.96 and the p-value is less than 0.05. Therefore, the relationship between variables is considered significant and accepted.

The Effect of ChatGPT Contribution on Self-efficacy

Hypothesis H1 is not accepted, indicating that ChatGPT's contribution does not have a positive and significant influence on the self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Limitations of ChatGPT in the context of economic learning, perceptions of the impact of dependence on ChatGPT, lack of emotional support in improving self-efficacy, and a high level of self-efficacy before using ChatGPT are several factors that can explain why ChatGPT does not affect the self-efficacy of economics education students.

Economics education students give high marks to ChatGPT's AI technology knowledge and participation in economics learning, but there is awareness that ChatGPT has limitations, such as producing output that is inaccurate or out of context. Therefore, students do not completely rely on ChatGPT to increase their self-efficacy in understanding economic material because awareness of the limitations of the technology reduces their confidence in using ChatGPT as the only learning resource. Over-reliance on ChatGPT can also hinder the development of general skills such as writing, teamwork, and problem-solving skills. Using ChatGPT as a primary source of academic consultation can reduce a student's ability to think critically. In situations where answers are provided instantly by ChatGPT, students may miss the opportunity to develop skills in analyzing, evaluating, and synthesizing information. If students rely too much on ChatGPT to solve problems or understand material, they start to doubt their own abilities. It is important for students to use a variety of learning resources, including ChatGPT, but also to seek help from lecturers, peers, or other sources. This is supported by previous theory and research which emphasizes the importance

of not only introducing advanced technology but also considering how technology can be integrated into the learning process effectively (Szymkowiak et al., 2021).

Emotional support, both from peers and lecturers, can play an important role in motivating and building the self-confidence of economics education students. Interactions rich in emotional support can help students feel supported, accepted, and motivated to overcome academic challenges. Although ChatGPT can provide objective information and explanations, they have limitations in understanding and responding to human emotions. This is in line with previous research, which emphasizes the importance of recognizing that emotional support provided by colleagues and lecturers has unmatched added value compared to technology (Hillmayr et al., 2020; Kim et al., 2022; Poon et al., 2021).

The Influence of Digital Literacy's Contribution on Self-efficacy

Hypothesis H2 is not accepted, indicating that digital literacy does not have a positive and significant influence on the self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Factors such as focus on the context and special needs of economics education students, variability in education students' responses economics, and other external factors can be taken into consideration in interpreting the results of this research.

Understanding the context and specific needs of economics education students is key to exploring why digital literacy is not considered a highly relevant factor in shaping their self-efficacy. Economic education students focus more on understanding economic concepts, data analysis, and solving economic problems rather than digital technology skills. The discipline of economics demands an understanding of theory, analysis of empirical data, and application of economic concepts. The UM and UNESA Economics Education Undergraduate Study Program curriculum emphasizes academic and practical aspects of economics, such as economic theory, public policy and market analysis. Digital technology skills do not receive the same high level of emphasis in their curricula compared to courses more closely related to technology or computers. Although digital literacy can provide additional advantages in communication and access to information, this skill is considered a complement rather than the main focus in forming economic education students' self-efficacy. Variations in economic education students' responses to digital literacy also reflect variations in their skill levels and experience in using technology. Students have different backgrounds and experiences in using digital technology. Those who are used to using technology feel more confident and skilled in ICT skills, while those who are less skilled or have limited experience feel less confident. Previous research also shows that different learning contexts can influence the impact of technology use experiences on self-efficacy (Nordlöf et al., 2019).

External factors such as social support, learning environment, and previous academic experience can have a greater influence in shaping the self-efficacy of economics education students. When students feel supported and acknowledged by those around them, they tend to feel more confident in facing academic challenges. A conducive learning environment, including adequate facilities, positive interactions between peers, and enjoyable learning experiences, can increase student self-efficacy. Positive experiences in academic contexts, whether in high school or in previous courses, can provide a strong foundation for student self-efficacy. This is consistent with previous theory which explains that direct experience in facing these challenges is more influential in shaping self-efficacy than technical ability alone (Kreth et al., 2019). In addition,

previous research explains that self-efficacy is also influenced by psychological factors such as personal experience, social support, perceptions of previous success, and self-regulation strategies (Duchatelet & Donche, 2019; Pillay et al., 2022; Trautner & Schwinger, 2020).

The Influence of the Contribution of Economic Literacy on Self-efficacy

Hypothesis H3 is accepted, which means there is a positive and significant influence of economic literacy on the self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. This occurs because of strong conceptual understanding, mastery of practical skills, adaptation to uncertainty, motivation, ability cognitive, and the ability to achieve goals and solve problems.

Economic education students with a strong conceptual understanding of economic literacy have understood basic economic concepts such as supply, demand, inflation, and economic inequality. Deep understanding also makes students aware of the relevance of economic concepts, both in everyday life, personal decisions, and on a broader scale such as social and global economic implications. Students can apply economic concepts to analyze situations, make decisions, and formulate solutions to complex economic problems. They can contribute actively in academic and professional forums and think critically about economic issues. This is consistent with previous research which shows that when students understand concepts such as supply and demand, inflation, and the impact of economic policy, they tend to feel more confident in dealing with material related to their field of study (Bowles & Carlin, 2020).

Practical skills in economic literacy encourage economic education students to apply the economic concepts they learn in real life situations. They have confidence that they can use their knowledge and skills to analyze situations, evaluate various options, and make sound decisions in an economic context. Practical skills also include the ability to effectively use economic analysis techniques, such as risk analysis, cost-benefit analysis, or economic modeling, to make rational decisions. This is consistent with previous research showing that economic literacy plays a key role in empowering students to make wise decisions and understand the complexities of the economic world (Andriamahery & Qamruzzaman, 2022).

Economic literacy gives economic education students an understanding of how the economy works and how external factors such as government policies or market changes can influence the economy. They can also take measured risks and make better decisions about effective financial management. Economic education students who can manage finances and make good financial plans, including managing savings for future needs, will have higher self-confidence in facing financial challenges. These findings are supported by previous research, which revealed that economic literacy not only influences students' understanding of economics but also prepares them to manage risks and make financial decisions, thereby giving them greater confidence in facing their financial challenges more effectively (Soroko, 2023).

Economic education students with a strong understanding of economic concepts tend to feel more motivated to learn. By understanding economic concepts, they can see more clearly how this knowledge and skills can help them achieve their academic goals, whether in the form of academic achievement, career development, or contributions to society. This finding is also supported by previous research which suggests that economic literacy is not only about understanding concepts

but also about developing practical skills and increasing the self-confidence of economic education students (Rastiti et al., 2021; Suratno et al., 2021).

Effect of ChatGPT Contribution on Study Results

There is no positive and significant influence from ChatGPT on the study results of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Technological limitations, less than optimal use, and the importance of human interaction are some of the factors that explain why the use of ChatGPT does not affect the study results of economics education students .

ChatGPT can generate quite sophisticated responses, but its ability to understand specific contexts remains limited. Economic education students need to crosscheck with other sources to ensure the accuracy and relevance of the information provided by ChatGPT. ChatGPT may not always handle complex tasks well. Some more complex concepts or questions require deeper understanding and more complex analysis than ChatGPT can handle. Students also need to consider the ethics associated with using ChatGPT, including the risk of plagiarism and academic integrity. This is supported by previous research which shows that a careful, critical and responsible approach is very important in using ChatGPT in educational contexts (Mhlanga, 2023; Rane et al., 2023; Rasul et al., 2018).

Although economics education students expressed a willingness to use ChatGPT, they did not fully understand its full potential in assisting the learning process. Students do not receive enough training or guidance on how to make good use of ChatGPT in learning. A lack of understanding of how to use ChatGPT effectively to achieve specific learning objectives can hinder its optimal use. This is consistent with theories which state that technology acceptance depends on rational considerations involving positive perceptions of its benefits, which in turn influences its use in learning (Cai et al., 2021; Chavoshi & Hamidi, 2019; Tsai et al., 2019).

ChatGPT can provide assistance in learning, but human interaction remains the key to effective learning. ChatGPT cannot completely replace deep and meaningful human interaction. As a result, the influence of ChatGPT on study results was not significant due to the need for social interaction and collaborative learning. Human interaction encourages students to develop important interpersonal skills such as communication, teamwork, and building healthy social relationships. Discussions and interactions with fellow students or with lecturers allow sharing ideas, questioning assumptions, and considering different points of view. This finding is in line with previous research showing that, although ChatGPT can provide instant answers and additional information, it cannot completely replace human interaction (Kuraku et al., 2023; Roumeliotis & Tselikas, 2023; Wu et al., 2023).

The Influence of Digital Literacy Contribution on Study Results

Hypothesis H5 is accepted, showing a positive and significant influence of digital literacy on the study results of UM and UNESA Economic Education Undergraduate Students class of 2021 and 2022. A high level of digital literacy gives economic education students wider access to economic information, supports deeper understanding, improve critical abilities, facilitate communication and collaboration, and provide confidence in the use of digital technology.

High ICT skills give economic education students wider access to relevant and up-to-date economic information through various digital sources, such as online journals, economic databases and social platforms. This wider access encourages students to get the latest information about global economic developments, market trends, the latest research in the field of economic education, and various economic concepts that are being debated or studied. Students can explore various perspectives and research related to economic theory and understand the practical application of these theories in real-world contexts. With advanced ICT skills, students can use various software and data analysis techniques to process and analyze economic data more sophisticatedly. Students can develop their abilities to solve economic problems more effectively. This is in line with previous research which shows that digital literacy not only helps students in the learning process but also opens up opportunities to achieve better study results (Basir et al., 2021; Liu et al., 2020).

Critical analysis skills in analyzing digital information encourage economic education students to assess the information they receive from digital sources objectively and rationally. Students can develop a deeper understanding of economic theory by filtering the information they receive and focusing on quality and trustworthy sources. This encourages a proactive attitude towards learning and self-development. The findings of this research are also supported by previous research which shows that digital literacy provides students with the abilities needed to explore and understand the economic material they study, as well as improve their analytical and critical skills (Churchill, 2020; Tohara et al., 2021).

Awareness of digital security also makes students feel more confident in using digital technology effectively. They have a clear understanding of the risks and threats associated with online interactions, as well as the steps they can take to address those risks. They take precautions to protect themselves and their personal information when interacting online. This is supported by previous research which shows that good awareness and understanding of digital security can increase productivity, effectiveness and quality of interactions in digital environments (Kateryna et al., 2020).

Effective use of digital platforms has a significant positive impact in improving communication among economic education students. They can share information, ideas and materials in real-time via text message, email or social media. Collaboration like this allows students to support each other and complement each other's skills, thereby improving the quality and efficiency of group work. The use of digital platforms also facilitates students in sharing creative ideas in the context of economic education. They can quickly and easily post their ideas, questions or thoughts about certain economic topics on social media or other platforms. This is in line with previous research which shows that effective use of digital platforms plays an important role in improving collaboration and communication among students (Singh et al., 2020).

The Influence of the Contribution of Economic Literacy on Study Results

Hypothesis H6 states that there is a positive and significant influence of economic literacy on the study results of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022, and this hypothesis is accepted. Economic literacy provides a strong foundation for economic education students to understand learning material, apply economic concepts in real-world contexts, and develop the psychomotor skills necessary for efficient financial management.

Economic education students' positive perceptions of economic literacy knowledge and skills reflect a strong understanding and acceptance of fundamental economic concepts. Skills in basic economic concepts such as resource allocation, the laws of supply and demand, and their impacts demonstrate that students have a strong understanding of how economic systems operate. They understand how economic phenomena such as inflation, financial crises, and changes in interest rates can affect not only their own country's economy but also the global economy as a whole. They can evaluate the implications of economic decisions, forecast their impact, and consider possible alternatives. This is in line with previous research which shows that with strong economic literacy knowledge and skills, students are better prepared to engage in deeper economic discussions and analysis (Johan et al., 2021).

Economic education students who are skilled in applying economic concepts tend to be more actively involved in the economic decision-making process. One important aspect of applying economic concepts is the ability to identify existing economic problems. This includes issues such as market imbalances, income inequality, inflation, unemployment, etc. Previous research also suggests that economic literacy involves the ability to analyze economic data, policies and the implications of economic decisions (Goyal & Kumar, 2021).

Economic education students with good economic literacy develop a deep understanding of economic concepts through classroom learning, reading instructional materials, or practical experience. Students with good economic literacy can interpret economic data, recognize emerging patterns or trends, and identify the implications of the data in the context of the economic theory they study. Students with a good understanding of economic material are better able to relate the theories they study to economic phenomena that occur in their daily lives. This is supported by previous research which shows that with strong knowledge, understanding, analytical and evaluation skills, students can become critical thinkers and intelligent decision makers in various economic situations (Kitsantas et al., 2019).

Positive affective responses, such as feelings of happiness and motivation, can be the main driving force for economic education students' learning. When students feel happy and motivated to learn economic material, they are more likely to be actively involved in the learning process, seek additional information, and develop a deeper understanding of economic concepts. They are more likely to ask questions, share thoughts, and participate in learning activities that require social interaction. This is in line with previous research which shows that paying attention to the affective domain can create a learning environment that builds students' emotional well-being and character development, ensuring that the economic learning process has a positive and sustainable impact on student development (Feng et al., 2020).

Psychomotor skills related to financial management include the ability to create a budget, prioritize expenses, and manage income efficiently. Economics education students with these skills can adeptly identify their needs and wants and set budget limits for each spending category. They also have good habits in managing savings, such as setting aside a portion of their income for immediate or future needs. Solid psychomotor skills also include the ability to understand and evaluate product, price, and promotional information before making a purchasing decision. This is supported by previous research which states the importance of economic education in preparing a generation that is competent, thinks critically and is responsible for facing complex challenges in modern life (Núñez-Canal et al., 2022).

The finding of the positive influence of economic literacy on the study results of economic education students can also be seen from the UAS scores for the Science and Skills Subjects of the Undergraduate Economic Education Study Program, namely Monetary Economics, Entrepreneurship (KWU), and Banks and Non-Bank Financial Institutions (BLKBB). From the three courses that are relevant to the field of economic education, it can be seen that the majority of students are able to understand the material well, as indicated by the relatively high average score (8 – 9). Students with a high level of economic literacy tend to obtain higher grades in KWU, because they can better understand and apply economic concepts related to entrepreneurship. Economic literacy can also have an impact on student study results in BLKBB courses. Students who have a better understanding of economic concepts related to banks and non-bank financial institutions tend to obtain higher grades. In the Monetary Economics course, economic literacy also plays an important role. Students who are able to relate monetary economic concepts to economic reality and have a deep understanding of monetary policy and its implications tend to get better grades. Previous research suggests that a good literacy level can encourage students to obtain good study results (Gultom & Oktaviani, 2022; Nur Hafifah & Harry Sulistyo, 2020).

The Influence of Self-efficacy on Study Results

Hypothesis H7 is accepted, showing a positive and significant influence of self-efficacy on the study results of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Students who believe in their abilities tend to be more motivated, adaptive, and able to overcome academic challenges, thereby increasing academic success. they.

Economic education students who are confident in facing uncertainty tend to be more adaptive to changes and challenges that arise in the academic environment. Students who are confident in facing uncertainty tend to be more persistent in pursuing their academic goals. Previous research also reveals that students with high self-efficacy tend to have better resilience in overcoming obstacles and challenges that arise during the learning process (Etherton et al., 2022).

Strong internal motivation is the main driver for economic education students to continue learning and developing. Students who are confident in their ability to motivate themselves are better able to overcome obstacles that arise during the learning process. The ability to activate and use cognitive abilities effectively encourages students to better face academic tasks. They are more likely to be actively engaged in the learning process, seek deep understanding, and develop the skills necessary to succeed in their field of study. This is also supported by previous research, which shows that a high level of self-efficacy encourages students to be more actively involved in the learning process (Sökmen, 2021).

Confidence in problem-solving abilities also reflects a high level of resilience in economics education students. They can manage time efficiently, focus on important tasks, and avoid distractionsprocrastination, thereby using their time more productively for learning. They are more skilled at identifying the root of the problem, formulating strategies to overcome the problem, and implementing effective solutions. This is consistent with previous research showing that positive learning experiences can strengthen the belief that they are able to overcome more complex learning challenges to achieve better study outcomes (Awidi et al., 2019).

Confidence in academic abilities also influences the level of persistence of economic education students in studying the material. Students who believe they are able to understand the

material tend to be more persistent in pursuing in-depth understanding. This is in line with previous research which shows that high self-efficacy can improve the quality of student learning (Prifti, 2022).

*Self-efficacy*high levels are often associated with strong intrinsic motivation. Economics education students who are confident in their abilities tend to feel more confident in pursuing their academic goals, thereby increasing their intrinsic motivation to study diligently. This gives them additional energy and resilience to overcome challenges and obstacles that can arise during the learning process. This finding is supported by previous research which shows that students who have intrinsic motivation tend to have better study results because they study diligently and enthusiastically, not only to meet requirements or get grades, but also because they feel emotionally connected to the course material and finding intrinsic value in the learning process itself (Filgona et al., 2020).

*Self-efficacy*A high level creates confidence in economic education students that they are able to learn and apply the practical skills needed in their field. High self-efficacy can encourage students to seek additional practical experience outside the classroom. They are more active in seeking opportunities for internships, practical work, or research projects that allow them to apply and develop their practical skills in real-world situations. Previous research also explains that high self-efficacy provides additional encouragement for students to develop and use the practical skills needed in the field of economic education (Conradty et al., 2020).

The Influence of ChatGPT Contribution to Study Results Through Self-efficacy

There is no significant positive influence from ChatGPT on study results through the self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Limitations in providing emotional and motivational support, limited influence on understanding course material, and obstacles in developing general skills are the reasons. why there is no significant effect of ChatGPT on study results through the self-efficacy of economics education students.

The ChatGPT intervention cannot provide sufficient emotional and motivational support to strengthen economic education students' self-confidence in overcoming economic learning challenges. ChatGPT has limited ability to respond emotionally or provide moral support to students as it can through human interaction. ChatGPT is not effective enough in motivating students intrinsically. This finding is in line with previous research which shows that self-efficacy is more related to intrinsic motivation, such as students' perceptions of their ability to control situations and achieve their academic goals (Shin & Bolkan, 2021).

Although ChatGPT can provide information, its impact on understanding economic material is still limited. A deep understanding of the material is often built through direct interaction with the material, discussions with colleagues, and direct guidance from lecturers or tutors. ChatGPT, although it can provide answers or explanations, cannot provide the same learning experience as direct interaction with a lecturer or classmates. Class discussions, direct tutoring, and social interaction play an important role in deepening understanding of the material, broadening viewpoints, and building social skills. This is in contrast to previous research which explains that ChatGPT can strengthen student self-efficacy and study results (Bouzar et al., 2024).

The use of ChatGPT can also hinder the development of general skills of economic education students, such as writing skills, teamwork and problem solving. Students who rely on ChatGPT to provide answers or solutions related to economics learning can detract from actual practice and skill development. The ability to interact and collaborate with others is also an important aspect of developing effective self-efficacy. Over-reliance on ChatGPT to provide economic answers or solutions can hinder students' ability to think critically, creatively, and take initiative in problem solving. Previous research shows that ChatGPT may not always provide adequate support in this regard (Roumeliotis & Tselikas, 2023).

The Influence of Digital Literacy's Contribution to Study Results Through Self-efficacy

H9 is rejected, meaning that there is no significant positive influence of digital literacy on study results through self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022. Focus on academic and practical aspects in the field of economic education, diversity of students' abilities and experiences in using digital technology, other factors that influence self-efficacy, and the importance of analytical skills and substantial understanding can explain why digital literacy has no influence on self-efficacy and ultimately does not influence the study results of economic education students through the self-efficacy pathway.

The UM and UNESA Bachelor of Economics Education curriculum places more emphasis on academic and practical aspects of economics, such as economic theory, public policy and market analysis, rather than digital technology skills. This is because the curriculum is designed to meet the special needs and demands of this field of study, so digital literacy is not considered a main priority in shaping the self-efficacy of economics education students. Students are expected to understand basic economic principles, demand and supply analysis, as well as concepts such as price and income elasticity. This focus provides a strong foundation for developing a deep understanding of the subject matter, which then becomes a top priority in shaping the self-efficacy of economics education students. The diversity in students' abilities and experiences in using digital technology among economics education students can also provide a varied picture of their level of self-efficacy. Students with high levels of skill and experience tend to have higher self-efficacy in tasks involving digital technology, while others require additional support to develop their self-efficacy in this context. This finding is supported by previous research which shows that students with a high level of digital literacy can more easily find the learning materials needed to understand economic concepts or find additional references for their assignments (Liu et al., 2020).

External factors such as social support, learning environment, and previous academic experience can have a stronger influence in shaping the self-efficacy of economics education students, which in turn can improve study outcomes. Support from peers, family, and lecturers can give students confidence and confidence to overcome academic challenges. A conducive learning environment, including adequate facilities, positive interactions between students, and enjoyable learning experiences, can increase student self-efficacy. Positive experiences in academic contexts, both at the high school level and in learning previous material, can also provide a strong foundation for student self-efficacy.In increasing self-confidence to succeed in learning economics, economics education students need to have a deep understanding of economic concepts and the theories that underlie them..Digital literacy can help students access various sources of information about economics, but substantial understanding of this material is not only obtained through digital

literacy. This is supported by previous research which shows that in learning economics, students are faced with complex material and assignments that often require in-depth understanding and high analytical skills (Pasaribu & Dewi, 2021). Although students with better digital literacy tend to have higher self-efficacy and can achieve better study results, the relationship between these three variables is not strong enough to be considered significant. This could be caused by other factors that influence student self-efficacy and study results as has been revealed by previous research, such as the learning environment or other factors, which are not included in the analysis or measurements in this study (Wong et al., 2019).

The Influence of the Contribution of Economic Literacy to Study Results Through Self-efficacy

Hypothesis H10 is accepted, showing that there is a positive and significant influence of economic literacy on study results through the self-efficacy of UM and UNESA Economics Education Undergraduate Students class of 2021 and 2022.Through self-efficacy as an intervening variable, economic literacy can improve the study results of economic education students by giving them self-confidence, motivation, and the ability to overcome challenges that arise in the learning process.

High economic literacy equips economic education students with a deeper understanding of basic economic concepts. They can understand principles such as supply and demand, inflation, the impact of globalization, and the role of financial institutions. A strong understanding of these concepts encourages students to connect theory to real-world situations, predict the outcomes of economic decisions, and identify policy implications. This ability drives them to generate strong arguments, make wise decisions, and develop effective solutions to complex economic problems. This makes them face academic challenges more confidently and effectively, contributing to improving the quality of their studies in the field of economic education. This finding is supported by previous research which shows that economic literacy helps students understand the importance of academic achievement in economic education and increases their desire to succeed (Lopus et al., 2019).

Economic education students with good economic literacy feel confident in their understanding of economic theories and their ability to apply that knowledge in academic contexts.This belief encourages them to be more confident in expressing opinions, debating, and participating in class discussions. When students successfully apply their economic knowledge and skills in an academic context and see positive results, this strengthens their confidence in their own abilities. Previous research also supports these findings, showing that economic literacy can be a determining factor in improving the study results of economic education students (Muñoz-Murillo et al., 2020).

Economics education students who are confident in their ability to succeed in their studies tend to have higher motivation to study and achieve good results.When students successfully apply their economic knowledge and skills in an academic context and see positive results, this strengthens their belief in their own abilities.Economic literacy also trains students in analytical and problem solving skills, which in turn increases their self-efficacy in overcoming challenging academic assignments, such as case studies, economic projects, UTS, and UAS. Previous research

also revealed that this ability encourages them to face learning material with a more positive and confident attitude (Tong et al., 2022).

CONCLUSIONS

ChatGPT's contribution does not have a positive and significant influence on student self-efficacy, and does not have a direct impact on study results. Although there is a positive correlation between ChatGPT use and self-efficacy and ChatGPT and study outcomes, the low correlation values indicate that ChatGPT use only explains a small portion of the variation in students' self-efficacy and study outcomes. Digital literacy also does not have a positive and significant influence on student self-efficacy. However, economic literacy is proven to have a positive and significant influence on student self-efficacy and study results. The strong correlation between economic literacy and self-efficacy shows that students with a high level of economic literacy tend to have higher self-confidence in dealing with complex material in the context of economic education, which in turn has a positive impact on study results.

For students of economic education, it is advisable to note that although technologies such as ChatGPT offer potential, challenges in acceptance and implementation must be overcome to achieve maximum benefits. Additionally, digital literacy, although important, does not directly increase students' self-confidence in achieving academic goals. Therefore, the development of digital literacy needs to be accompanied by real experience in handling academic tasks and challenges. It is important for students to increase their economic literacy, because a high level of economic literacy contributes to increased self-efficacy and better study results. For future researchers, it is recommended to pay more attention to contextual factors and real experiences in handling tasks in evaluating the relationship between technology, literacy, self-efficacy, and study results. Economic Education Undergraduate Study Programs need to integrate strong economic literacy learning in their curriculum and consider appropriate pedagogical approaches to optimize the use of technology in improving student study outcomes. Thus, it is hoped that this effort can improve the overall quality of learning and academic achievement of economics education students.

CONFLICTS OF INTEREST STATEMENT

The authors declare no conflicts of interest related to the content of this manuscript. All co-authors have reviewed and approved the final version of the manuscript. Furthermore, the authors affirm that there are no financial interests to disclose. This manuscript is original and has not been submitted for publication elsewhere.

AUTHOR CONTRIBUTIONS

Istiqomah Ahsanu Amala and Wening Patmi Rahayu conceptualized the study and developed the theoretical framework. Heny Kusdiyanti conducted the data analysis and contributed to the methodological design. Jafalizan Md. Jali provided critical insights during the interpretation of findings and supervised the overall research process. All authors collaborated in discussing the results and contributed equally to writing and revising the final manuscript.

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