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THE IMPACT OF CIRCULAR ECONOMY EDUCATION ON THE STUDENT PERSONALITY PROFILE OF JUNIOR HIGH SCHOOL STUDENTS THROUGH ECONOMIC LITERACY AS AN INTERVENING FACTOR

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ABSTRACT

Education plays an important role in supporting sustainable development, particularly through strengthening economic literacy and fostering students' character in relation to sustainable consumption and production. The implementation of circular economy concepts in schools is expected to shape students' knowledge, behaviour, and awareness regarding sustainability. This research employed a descriptive quantitative approach with causal analysis. The population consisted of students at SMP Negeri 2 Jatiwangi, while the sample focused on Year 9 students who had received learning materials related to the circular economy and sustainable economic literacy. Data were collected through questionnaires using a Likert scale and documentation techniques. Data analysis was conducted using descriptive analysis and Partial Least Squares (PLS). Instrument testing included validity, reliability, and mediation testing using the Sobel test. The findings revealed that all indicators for circular economy education, economic literacy, and student profile met the requirements of validity and reliability. The results of hypothesis testing showed that circular economy education positively and significantly affects economic literacy and student profile. Economic literacy also positively and significantly affects student profile. Furthermore, economic literacy strengthens the relationship between circular economy education and student profile. These findings indicate that the implementation of circular economy-based education contributes to improving students' economic literacy and shaping positive student character towards sustainable development.

Keywords: *Circular economy, character, education, economic literacy*

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INTRODUCTION

Education plays a key role in driving and accelerating national development (Panoyo, 2024; Suharti & Haifaturrahmah, 2025). This is particularly true of national development oriented towards sustainable development (Mujidiatama & Husamah, 2024). Sustainable economic education can be supported by strengthening economic-environmental literacy. This is in line with the global agenda of the Sustainable Development Goals (SDGs), whereby education acts as a catalyst for behavioural change, management, and innovation in wise consumption and production (Lempas, 2025).

This education is capable of shaping students' character (Febrianti et al., 2022). Thus, if economic education is available, it can guide students towards good character, particularly in an economic context. However, in the fields of education and economics, these two concepts have yet to be reflected in the curriculum as interrelated learning (Lempas, 2025). Schools can develop curricula and learning strategies for economic education within the framework of sustainable development (Gunawan, 2023).

The reason is that the current economic model, based on production and consumption, does not incorporate the principle of sustainability; therefore, a circular economy model is required as an alternative (Judijanto, 2025). Consequently, education in sustainable economics can shape mindsets and behaviours that focus on the circular economy (Manik, 2022).

The concept of economic education is prioritised as a form of learning that encompasses market concepts and economic efficiency, and is complemented by economic analysis covering externalities, environmental carrying capacity, policy models, and sustainable consumption competencies (Lempas, 2025; Laudie et al., 2025; Azzahra & Akbar, 2025; Dyanasari et al., 2022). The principles of the circular economy can be used as learning outcomes in relation to the dimensions of knowledge, analytical skills, dispositions, and behavioural intentions (Lempas, 2025). Curriculum interventions can enhance learning materials and sequences of learning experiences that influence behavioural determinants (Dewi, 2019; Nurhayati et al., 2022; Yusuf et al., 2025).

Economics education must equip learners with the ability to critically assess claims of circularity, including clear indicators, objectives, and policy models. Enhancing the integration of sustainability requires an explicit mapping of the relationship between circular economy concepts and specific targets for responsible consumption and production, climate action, and decent work. At the pedagogical level, project-based learning and the strengthening of sustainability competencies are considered effective in supporting transformative learning (Filho et al., 2016).

Education on the circular economy and economic literacy are essential for all students, particularly those at lower secondary level (SMP) (Handawati & Mataburu, 2020). Lower secondary students occupy an educational stage between completing primary education and preparing for upper secondary education. Consequently, further guidance is required on sustainable development through the circular

economy. Furthermore, junior high school students are young talents capable of innovating and creating sustainable waste management solutions (Santosa et al., 2026).

It is important to incorporate this circular economy education into the curriculum; for instance, research by Satvikadewi et al. (2025) demonstrates that circular economy literacy for junior high school students can be fostered through a collaborative science communication approach using short films. Students are more engaged in learning about the economy and understanding sustainability. Furthermore, teachers can adapt engaging and innovative teaching materials. This programme demonstrates that short films can serve as an effective tool for enhancing young people's understanding of complex issues and encouraging their participation in sustainable solutions.

Further research by Rofiqi et al. (2026) demonstrates that the circular economy and eco-entrepreneurship can be implemented in school settings through the use of plastic crusher technology. The implementation of the circular economy in schools can have a significant impact on social life, the community, and school management. The implementation of the circular economy is enhanced through the integration of management approaches, technology, and social participation.

Furthermore, research by Fadhlia et al. (2026) demonstrates that global economic literacy and youth awareness can boost participation and development. Programmes aimed at instilling critical awareness and a sense of agency in students enable them to participate actively in realising inclusive and sustainable development. This means that students do not merely listen but know, understand, and participate effectively and creatively.

As in Majalengka Regency, circular economy programmes and sustainable economic literacy have already been introduced in schools. This economic education serves as a means of character building and broadening students' horizons. For example, at SMP Negeri 2 Jatiwangi, teaching incorporates the concepts of the circular economy, waste management, and the enhancement of economic literacy. Students are encouraged to learn about and understand the circular economy for the sake of sustainability.

This warrants in-depth research, particularly regarding the extent to which circular economy education influences student character through economic literacy as an intervening medium. The aim is to identify and measure the impact of circular economy education on student character through economic literacy as an intervening medium.

RESEARCH METHOD

This study employs a descriptive quantitative approach. With regard to the concept of cause and effect, the rationale is that this study identifies a causal relationship (Sugiyono, 2020). This causal relationship is found in the variables of circular economy education, student character, and economic literacy. This means that this study focuses on the influence of circular economy education on the

character of junior high school students through economic literacy as an intervening variable. This study was conducted in November and December 2025. The research location was State Junior High School 2 Jatiwangi, in accordance with the location of the research subjects and objects.

The study population consisted of pupils at SMPN 2 Jatiwangi. The population comprised 1,083 pupils. This population had studied material on the circular economy and sustainable economic literacy, which was developed through hands-on activities, practical exercises and creative tasks. Determining the sample size using a formula:

$$n = \frac{Z^2 1\text{-}a/2P\ (1\text{-}P)}{d^2}$$

Explanation of the formula:

n = Sample size

z = 1,96 score at a given level of significance (95%)

P = The margin of error, or maximum error rate, is 5%

d = alpha (0,10) or sampling error = 10%.

Therefore, the research sample comprises

$$n = \frac{1{,}96^2 .\ 0{,}5\ (1\text{-}0{,}5)}{(0{,}1)^2}$$

$$n = \frac{3{,}8416\ .\ 0{,}25}{0{,}01}$$

n = 96,04 = 100

The sample size was set at 96, which could be expanded to 100 respondents, selected using purposive sampling.

The data collection methods used in this study included questionnaires and documentation. A questionnaire is a data collection technique that involves distributing a set of written questions or statements for respondents to answer. Questionnaires are a data collection technique that uses a Likert scale for assessment. Documentation is a method of obtaining data relating to a subject and variables in the form of minutes, books, scientific journals, newspapers, magazines, websites, and so on.

The measurement scale used in this study is the Likert scale. The research variables measured using the Likert scale are presented as variable indicators in the instrument items, which take the form of statements or questions. There are four response options: strongly disagree (1); disagree (2); agree (3); and strongly agree (4). Research variables are guidelines established by the researcher to study, examine, and obtain information relating to the subject matter, from which conclusions can be drawn. The variable used is Circular Economy Education (X), which influences Student Profile (Y), mediated by Economic Literacy (M). This relates to the Theory of Experiential Learning (Kolb, 1984), which explains that effective learning occurs through concrete experience, reflection, conceptualisation and active experimentation. Circular economy education generally employs hands-on methods, recycling projects, waste management simulations, or green

entrepreneurship, which enable participants to experience the learning process in a tangible way. Such meaningful experiences can help internalise the values of sustainability, thereby shaping more consistent patterns of thought and behaviour, such as creativity in utilising waste, concern for the environment, and problem-solving skills.

Table 1.
Operational Definitions of The Variables

Variable	Indicator	Measurement
Circular Economy Education (X)	1. Reduction, recovery and recycling 2. Sustainable product design 3. Use of renewable energy 4. Waste management education 5. Technological innovation 6. Collaboration between government, business and the community (Febrian & Solihin, 2024)	Likert Scale
Student Profile (Y)	1. Openness, 2. Conscientiousness, 3. Extraversion, 4. Agreeableness, 5. Neuroticism Theory Big Five Personality Traits (OCEAN), (Costa dan Mc Crae (1992) in Azhari, 2024))	Likert Scale
Economic Literacy (M)	1. Understanding personal income 2. Understanding the allocation of scarce resources, 3. Analysing the costs and benefits of economic transactions, 4. Analysing costs and benefits in economic decision-making The National Council on Economic Education (NCEE) (Kurniawati, 2024)	Likert Scale

Source: Processed by the Researcher (2026)

Instrument validation in this study utilised three tests. Firstly, validity testing to determine the validity of the data, which will be used to draw conclusions. Secondly, reliability testing to determine whether the instrument is trustworthy. Thirdly, mediation testing using the Sobel test. The Sobel test is used to test the significance of variable X on variable Y through the mediation of variable M.

The data analysis in this study employs descriptive data analysis. The aim is to interpret the respondents' arguments regarding their answers to the questionnaire. Descriptive analysis in this research involves the process of transforming research data into tabular form to facilitate understanding and interpretation of the data. Further data analysis in this study was conducted using PLS analysis. PLS analysis is a multivariate statistical technique that applies comparisons between multiple dependent and independent variables.

RESULTS AND DISCUSSION

RESULTS

Evaluation Model

1. Outer Model

An outer model was constructed to assess the reliability and validity of the indicators comprising the latent construct. The measurement model can be evaluated against the reflective model through tests of convergent validity, discriminant validity and composite reliability. The results of the measurement model are as follows:

a. Convergent validity

Convergent validity is a measure that demonstrates the relationship between reflective items and their latent variable. An indicator is said to meet the criteria for convergent validity when the factor loading is greater than 0.5.

Table 2.
Convergent Validity

Variable	Indicator	Loading Factor	Details
Circular Economy Education (X)	X1	0.854	Valid
	X2	0.756	Valid
	X3	0.849	Valid
	X4	0.793	Valid
	X5	0.843	Valid
	X6	0.821	Valid
Student Profile (Y)	Y1	0.780	Valid
	Y2	0.864	Valid
	Y3	0.776	Valid
	Y4	0.759	Valid
	Y5	0.856	Valid
Economic Literacy (M)	M1	0.829	Valid
	M2	0.834	Valid
	M3	0.767	Valid
	M4	0.708	Valid

Source: Processed by the Researcher (2026)

The table above shows that the loading factors for the indicators of the variables Circular Economy Education (X), Student Profile (Y) and Economic Literacy (M) are all greater than 0.5. Consequently, these indicators are deemed valid as measures of their latent variables.

b. Discriminant Validity

The test of discriminant validity in this study utilised cross-loading values and the average square root (AVE) to determine whether the research instrument was valid in explaining or reflecting the latent variable.

Table 3.
Discriminant Validity

Variable	Circular Economy	Student Profile	Economic Literacy	Details
X1	**0.854**	0.590	0.452	Valid
X2	**0.756**	0.678	0.482	Valid
X3	**0.849**	0.531	0.650	Valid
X4	**0.793**	0.586	0.579	Valid
X5	**0.843**	0.564	0.420	Valid
X6	**0.821**	0.505	0.644	Valid
Y1	0.576	**0.780**	0.611	Valid
Y2	0.565	**0.864**	0.501	Valid
Y3	0.538	**0.776**	0.445	Valid
Y4	0.544	**0.759**	0.676	Valid
Y5	0.613	**0.856**	0.502	Valid
M1	0.573	0.556	**0.829**	Valid
M2	0.552	0.603	**0.834**	Valid
M3	0.472	0.598	**0.767**	Valid
M4	0.486	0.368	**0.708**	Valid

Source: Processed by the Researcher (2026)

The results of the discriminant validity test in the table above present the cross-loading calculations, which show that the cross-loading values for each indicator of the variables Circular Economy Education (X), Student Profile (Y), and Economic Literacy (M) are higher than the cross-loading values of the other latent variables. All values are above the threshold of 0.5, so the research instrument is considered to have discriminant validity.

c. Composite Reliability

Composite reliability is assessed by examining the composite reliability scores of the indicator blocks that measure the Cronbach's alpha values. A construct is considered reliable if the composite reliability score is above 0.7 and the Cronbach's alpha value is recommended to be above 0.6.

Table 5.
Composite Reliability

Variable	Composite Reliability	Cronbach alpha	Details
Circular Economy Education (X)	0.903	0.902	Valid
Student Profile (Y)	0.867	0.866	Valid
Economic Literacy (M)	0.805	0.793	Valid

Source: Processed by the Researcher (2026)

Based on the results of the above tests, the three variables analysed were found to have good composite reliability, as their composite reliability scores were above 0.70 and their Cronbach's alpha scores were above 0.6. Consequently, further

analysis can be carried out by examining the model's goodness of fit through an evaluation of the internal consistency of the model.

2. Inner Model

The inner model aims to predict the relationships between latent variables by examining the significance values and R-squared values of the research model

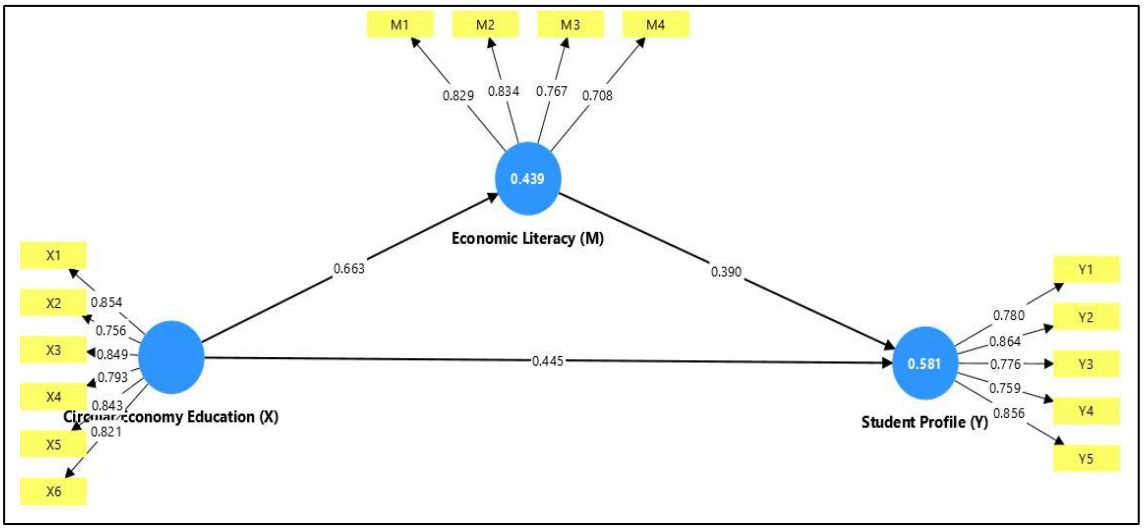

Figure 1.
Inner Model
Source: Processed by the Researcher (2026)

The evaluation of the PLS structural model begins by examining the R-squared value for each dependent latent variable. The R-squared values can be used to determine whether the influence of a particular exogenous latent variable on an endogenous latent variable is statistically significant.

Table 6.
R-Square

Variable	R-Square	R-Square Adjusted
Student Profile (Y)	0.581	0.568
Economic Literacy (M)	0.431	0.431

Source: Processed by the Researcher (2026)

The table above shows that the R-Square value for the Student Profile (Y) variable is 0.581; 58.1% of the variation in the Student Profile (Y) variable can be explained by the circular economy education variable, whilst the remaining 41.9% can be explained by other variables not included in this study. Meanwhile, the Economy Literacy (M) variable shows an R-Square value of 0.431, meaning that the circular economy education variable can be explained by Economy Literacy (M) by 43.1%, with the remaining 56.9% explained by other variables not included in this study.

3. Hypothesis Testing

The purpose of testing a structural equation model is to explain the relationships between the variables in the study. The structural model was tested using PLS software, whilst mediation was tested using the Sobel test. The basis for directly testing the hypotheses is the graphical output and the values found in the path coefficients. The basis used for testing hypotheses directly is that if the p-value is < 0.05 (significance level = 5%), then a significant effect of the exogenous variable on the endogenous variable is declared. The following is a complete explanation of hypothesis testing:

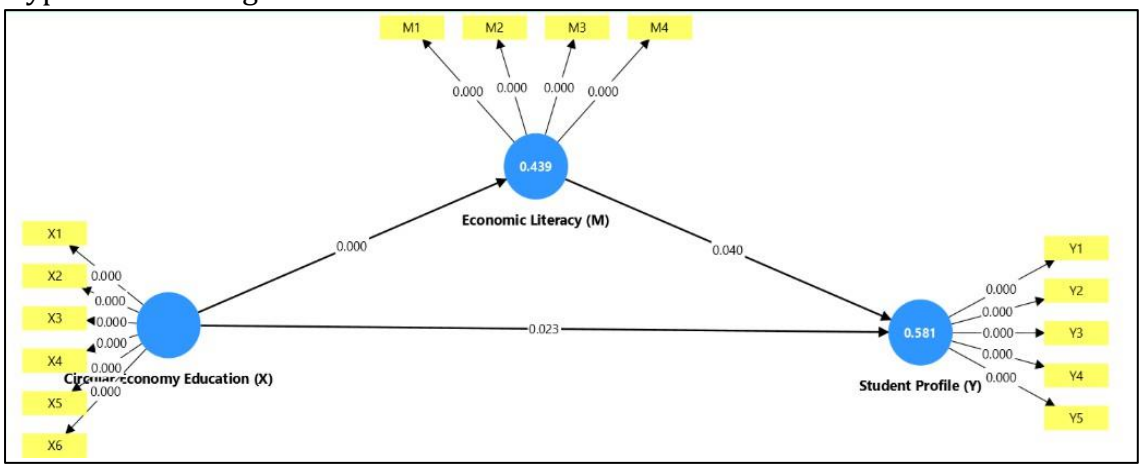

Figure 2.
Uji Hipotesis
Source: Processed by the Researcher (2026)

Table 7.
Relationships between Research Variables

Variabel	Original Sample (O)	Sampel Mean (M)	STDEV	T-Statistic (|O/SDEV|)	P-Value
Circular Economy Education (X) ->Economic Literacy (M)	0.663	0.666	0.088	7.563	0.000
Circular Economy Education (X) ->Student Profile (Y)	0.445	0.461	0.195	2.279	0.023
Economic Literacy (M) -> Student Profile (Y)	0.390	0.374	0.190	2.050	0.040

Source: Processed by the Researcher (2026)

In PLS, statistical testing of each hypothesised relationship is carried out using simulation. In this case, this is done using the bootstrapping method on the sample. The results of the PLS bootstrapping analysis are as follows:

a. The effect of circular economy education (X) on economic literacy (M). The results of the first hypothesis test show that the direct effect of circular economy education (X) on economic literacy (M) yields a coefficient of 0.663, a p-value of

0.000 and a t-statistic of 7.563. The p-value of 0.000 is less than 0.05 and the t-statistic of 7.563 is greater than the critical t-value of 1.64. These results indicate that circular economy education (X) has a significant direct effect on economic literacy (M). Consequently, the hypothesis stating that circular economy education (X) has a direct effect on economic literacy (M) is accepted.

b. The effect of circular economy education (X) on student profile (Y). The results of the first hypothesis test show that the direct effect of circular economy education (X) on student profile (Y) yields a coefficient of 0.445, a p-value of 0.023 and a t-statistic of 2.279. The p-value of 0.023 is less than 0.05 and the t-statistic of 2.279 is greater than the critical t-value of 1.64. These results indicate that circular economy education (X) has a significant direct effect on student profile (Y). Consequently, the hypothesis stating that circular economy education (X) has a direct effect on student profile (Y) is accepted.

c. The effect of economic literacy (M) on student profile (Y). The results of the first hypothesis test show that the direct effect of economic literacy (M) on student profile (Y) yields a coefficient of 0.390, a p-value of 0.040 and a t-statistic of 2.050. The p-value of 0.040 is less than 0.05 and the t-statistic of 2.050 is greater than the critical t-value of 1.64. These results indicate that economic literacy (M) has a significant direct effect on student profile (Y). Consequently, the hypothesis stating that there is a direct effect of economic literacy (M) on student profile (Y) is accepted.

The mediation analysis was conducted using the Sobel test to examine whether economic literacy (M) mediates the relationship between circular economy education (X) and student profile (Y). The indirect effect was calculated by multiplying the path coefficient from circular economy education to economic literacy (a) and the path coefficient from economic literacy to student profile (b).

The results of the first hypothesis test show that the direct effect of economic literacy (M) on student profile (Y) yields a coefficient of 0.390, a p-value of 0.040, and a t-statistic of 2.050. The p-value of 0.040 is less than 0.05 and the t-statistic of 2.050 is greater than the critical t-value of 1.64. These results indicate that economic literacy (M) has a significant direct effect on student profile (Y). Consequently, the hypothesis stating that there is a direct effect of economic literacy (M) on student profile (Y) is accepted.

Furthermore, the Sobel test was employed to assess the significance of the indirect effect of circular economy education (X) on student profile (Y) through Economic Literacy (M). The Sobel test evaluates whether the mediation effect differs significantly from zero by considering the coefficients and standard errors of the constituent paths. A Sobel test result with a significance value below 0.05 indicates that the indirect effect is statistically significant, confirming the mediating role of economic literacy.

Therefore, the findings demonstrate that economic literacy functions as a mediator in the relationship between circular economy education and student profile. This suggests that participation in circular economy education enhances students' economic literacy, which subsequently contributes to the development of a stronger student profile. The mediation results support the proposition that improvements in economic literacy constitute an important mechanism through which circular economy education influences student characteristics and competencies.

DISCUSSION

The findings demonstrate that circular economy education has a positive and significant effect on economic literacy. this result can be explained by the constructivist learning perspective, which argues that knowledge is developed through meaningful experiences and contextual problem-solving rather than through passive information transfer. Circular economy education introduces students to real-world issues such as resource efficiency, waste reduction, recycling, and sustainable consumption, enabling them to connect economic concepts with everyday practices.

From the perspective of economic education, literacy extends beyond understanding economic theories to include the ability to analyze economic problems, evaluate alternatives, and make responsible decisions. Through project-based learning, collaborative activities, and environmental problem-solving, students acquire practical economic competencies that strengthen their economic literacy. Consequently, students become more capable of understanding the relationships among production, consumption, resource management, and sustainability.

This is consistent with research by Hutasuhut et al. (2025) which reveals that there is a significant correlation between economic education and financial literacy. There is a close relationship between economic education and financial literacy, such that an increase in economic education is followed by an increase in financial literacy. This research was also supported by Aisyahrani (2024) which explains economic education plays a vital role in improving financial literacy. Good financial literacy helps individuals make sound financial decisions and achieve their financial goals.

These findings reinforce the idea that economic education should integrate sustainability principles to prepare students for future economic challenges. Circular economy education provides an authentic learning environment that facilitates the development of critical thinking, financial awareness, and responsible economic behavior.

The results also indicate that economic literacy significantly influences student profile. this finding suggests that students with higher economic literacy tend to demonstrate stronger competencies and personal characteristics that reflect the

expected student profile, including critical thinking, responsibility, collaboration, creativity, and decision-making skills.

This is in line with research by Yuli et al. (2024) which demonstrates that there is a positive correlation between economics education and the achievement of the learner profile in relation to the assessment of pupils' character. This research is supported by a presentation from Simanjuntak et al. (2024) a deeper understanding of the importance of economic factors in shaping pupils' interest in pursuing further education. The implications of this research can be used to design more inclusive education policies that support wider access to education for all sections of society.

Economic literacy is not limited to knowledge of economic concepts but encompasses the ability to evaluate choices, manage resources efficiently, and consider the long-term consequences of individual and collective actions. Students who possess these competencies are more likely to exhibit responsible citizenship and sustainable behavior, which are essential dimensions of the Student Profile.

This relationship can also be understood through competency-based education, which emphasizes that knowledge acquisition contributes to the formation of attitudes and behaviors. Economic literacy equips students with analytical and ethical reasoning skills, enabling them to become active learners who can solve problems and contribute positively to society. Therefore, improvements in economic literacy are expected to strengthen the overall development of student competencies.

The present findings are consistent with previous studies demonstrating that sustainability-oriented education enhances students' economic understanding and responsible behavior. Earlier research has shown that contextual learning approaches integrating environmental and economic issues improve students' critical thinking, decision-making abilities, and financial awareness.

Furthermore, the significant effect of economic literacy on student profile supports previous evidence indicating that economic competencies contribute to the development of twenty-first-century skills, including problem-solving, collaboration, and responsible citizenship. These findings reinforce the argument that economic literacy serves as an important educational outcome that extends beyond cognitive achievement and influences students' personal and social development.

However, this study extends previous research by positioning economic literacy as a mediating variable between circular economy education and student profile. While earlier studies generally examined direct relationships between sustainability education and learning outcomes, this research demonstrates that improvements in student profiles occur through the enhancement of economic literacy. This finding provides a more comprehensive explanation of the mechanism through which circular economy education influences student development.

This is consistent with research Abut et al. (2023) states that students' economic literacy can influence their profile, particularly in terms of their saving behaviour. This study was supported by Uran & Titu (2025) which suggests that pupils' profiles can be influenced by good economic literacy. In particular, pupils' consumption-related profiles are shaped from an early age.

The findings contribute to the theoretical development of social science education by demonstrating that sustainability-based learning can be integrated with economic literacy development to produce broader educational outcomes. Traditional social science education often emphasizes conceptual understanding, whereas the circular economy perspective encourages students to apply interdisciplinary knowledge to solve authentic social, economic, and environmental problems.

The mediating role of economic literacy supports competency-based learning theories, which propose that knowledge acquisition serves as a foundation for developing attitudes, values, and behaviors. This study therefore strengthens the argument that social science education should move beyond content mastery toward the development of competencies required for sustainable development and responsible citizenship.

Moreover, the findings align with Education for Sustainable Development (ESD), suggesting that integrating circular economy principles into social science curricula can foster students who are economically literate, environmentally responsible, and socially engaged.

This study contributes to the growing literature on circular economy education in several ways. First, it provides empirical evidence that circular economy education positively influences economic literacy, confirming that sustainability-oriented educational interventions can improve students' economic competencies. Second, this research expands the existing literature by identifying economic literacy as an important mediating mechanism linking circular economy education to student profile. This mediation model explains not only whether circular economy education is effective but also how it produces meaningful educational outcomes.

Third, the study offers an integrated conceptual framework that connects sustainability education, economic literacy, and student competency development. This integrated perspective remains relatively underexplored in previous studies, particularly in the context of social science education. Consequently, the findings provide a theoretical foundation for future research investigating the role of circular economy principles in shaping economically literate, socially responsible, and sustainability-oriented students.

CONCLUSION

The research findings indicate that all indicators under the variables circular economy education (X), economic literacy (M), and student profile (Y) met the criteria for validity and reliability. The composite reliability and Cronbach's alpha

values for all variables were also above the required minimum thresholds, meaning the research instrument was deemed reliable and suitable for use in further analysis. Furthermore, the results of the internal model evaluation indicated that the research model possessed a reasonably good explanatory power. Based on the results of the hypothesis testing, all relationships between variables in this study were found to be significant. Circular economy education has a positive and significant effect on economic literacy with a coefficient value of 0.663 and a p-value of 0.000. Furthermore, circular economy education also has a positive and significant effect on student profile with a coefficient value of 0.445 and a p-value of 0.023. Economic literacy has a positive and significant effect on student profile with a coefficient of 0.390 and a p-value of 0.040. These results indicate that the implementation of circular economy-based education not only enhances students' economic literacy but also helps to shape a better student profile. Economic literacy acts as a variable that strengthens the relationship between circular economy education and student profile.

This research suggests that circular economy education strengthens the development of economic literacy, which in turn shapes the student profile, thereby enriching the study of social sciences education through the integration of perspectives on Education for Sustainable Development (ESD), economic literacy and competence-based learning. In practical terms, these findings encourage social studies teachers to implement contextual, project-based learning, case studies and problem-solving that link economic concepts to sustainability issues. For curriculum development, the research results highlight the importance of integrating circular economy principles into objectives, content, learning strategies and assessment to produce learners who possess economic competence and a concern for sustainability. Nevertheless, this study has limitations as it employs a cross-sectional design, relies on questionnaire data, and only examines economic literacy as a mediating variable; consequently, the generalisability of the results remains limited. Therefore, future research is recommended to use a longitudinal or experimental design, expand the sample scope, and integrate other variables such as environmental literacy, critical thinking, learning motivation, or sustainability awareness in order to gain a more comprehensive understanding of the mechanisms by which student profiles are shaped through circular economy education.

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