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21st Century Sociology Learning: Integrating Digital Literacy, Collaboration, and Critical Thinking

Rani Kartika[1](✉), Annisa Putri[2], Gusmira Wita[3], Sigit Purnomo[4]
[1,2,3]Universitas Negeri Padang, Indonesia
[4]Universitas Sarjanawiyata Tamansiswa, Indonesia

✉Correspondence Author:
ranikartika@unp.ac.id

Abstract
The rapid transformation of global society in the digital age necessitates the integration of 21st century competencies in higher education, particularly in the field of sociology. This study investigates the effectiveness of integrating digital literacy, collaborative learning, and critical thinking into sociology education among undergraduate students. A descriptive quantitative method was employed, involving 35 students from the Sociology Education Study Program at a public university in Indonesia. Data were collected through a validated Likert-scale questionnaire comprising 30 items across three core constructs. Descriptive statistical analysis revealed that students perceived the integration of these competencies to be highly effective. Digital literacy scored a mean of 4.31 (SD = 0.46), collaborative learning 4.25 (SD = 0.52), and critical thinking 4.37 (SD = 0.48), all categorized as "very high." The overall average score was 4.31, corresponding to 86.2% in percentage agreement. These findings suggest that the learning model successfully fosters essential 21st century skills, equipping students with digital fluency, social collaboration, and analytical capacity in the context of sociological inquiry. The study concludes that a purposeful pedagogical design embedding these three competencies enhances students' academic engagement and critical sociological understanding. It also calls for broader implementation and further research to explore long-term impacts and institutional scalability of 21st century learning frameworks in higher education.

Keywords
21st century learning; collaboration; critical thinking; digital literacy

INTRODUCTION

The 21st century has brought transformative changes to the educational landscape, driven by rapid technological advancements, globalization, and evolving societal needs. These changes demand a redefinition of the skills and competencies students must acquire

to succeed in a complex, interconnected world. Among these competencies, digital literacy, collaboration, and critical thinking have emerged as essential components of effective learning, particularly within the social sciences such as sociology (Martínez-Bravo et al., 2022). Traditional approaches to sociology education, often centered on rote memorization and individual learning, are increasingly seen as insufficient in preparing students to analyze, interpret, and respond to contemporary social issues.

In recent years, there has been a growing recognition that educational institutions must adapt their curricula and pedagogical strategies to integrate 21st century skills. Digital literacy enables students to access, evaluate, and utilize information from diverse digital sources a critical competency in the information age (Utaminingsih, 2023; Machin-Mastromatteo, 2021; Tenya et al., 2024). Collaboration fosters interpersonal communication, teamwork, and social interaction, which are fundamental to sociological inquiry and community engagement (Setiawardani et al., 2021). Critical thinking, meanwhile, empowers learners to question assumptions, analyze arguments, and make reasoned decisions based on evidence Leaning (Aslan et al., 2025). These three competencies are not only interrelated but also central to developing sociological perspectives that are analytical, reflective, and action-oriented.

However, there remains a gap in practical implementation within higher education, especially in the context of sociology programs in developing countries. While policies may advocate for 21st century skill integration, the actual teaching and learning practices often lag behind, constrained by limited resources, outdated methodologies, and a lack of digital readiness among educators and students. Previous studies have highlighted the importance of context-sensitive approaches that align educational innovation with local institutional capacities and student needs (Damanik & Muhammad, 2025).

This study seeks to address that gap by exploring how digital literacy, collaboration, and critical thinking can be effectively integrated into sociology education. Focusing on a sample of 35 undergraduate students enrolled in the Sociology Education Study Program at a public university in Indonesia, this research aims to design and assess a learning framework that promotes meaningful engagement with sociological content through the lens of 21st century competencies. By doing so, this study contributes to the growing body of literature on innovative pedagogy and offers practical insights for educators seeking to modernize sociology instruction in line with global educational standards.

LITERATURE REVIEW

The shift towards 21st century learning in higher education reflects the need to equip students with competencies essential for navigating the complexities of modern life and work. Frameworks developed by global organizations such as the Partnership for 21st Century Learning and UNESCO emphasize the importance of learning and innovation skills, digital literacy, and life and career skills (UNESCO, 2018). Within this framework, education must go beyond content delivery to foster analytical thinking, creativity, collaboration, and technological fluency. These competencies are particularly relevant in disciplines like sociology, which require students to understand and respond to dynamic social realities.

Digital literacy encompasses the ability to access, evaluate, and create information using digital technologies (Utaminingsih, 2023). In sociology education, digital tools such as online databases, data visualization platforms, and collaborative learning environments enable students to explore sociological phenomena with greater depth and interactivity (Martínez-Bravo et al., 2022). Research by Leaning (2019) highlights that digital literacy not only supports academic performance but also enhances students' ability to critically engage with digital media and social discourse. However, challenges persist in terms of equitable access, digital pedagogy readiness, and integration into disciplinary contexts (Aslan et al., 2025).

Collaborative learning emphasizes student interaction, group problem-solving, and knowledge co-construction, aligning closely with the sociological tradition of dialogic inquiry (Utaminingsih, 2023; Brundage et al., 2023; Zabolotna et al., 2025). In the context of sociology education, collaborative tasks can deepen students' understanding of social concepts through peer discussion, joint research projects, and community-based assignments. (Serrar & Ibrahimi, 2025) argue that well-structured collaborative environments contribute to improved learning outcomes, motivation, and interpersonal skills. However, successful implementation requires careful facilitation to ensure balanced participation and critical reflection among group members (Serrar & Ibrahimi, 2025).

Critical thinking is the cornerstone of sociology education, as it encourages students to question assumptions, analyze social structures, and propose evidence based solutions to societal issues (Padua, 2025; Bashi, 2023; García-Moro et al., 2021). (Martínez-Bravo et al., 2022) asserts that teaching critical thinking requires intentional instructional design,

including the use of case studies, debate, and reflective writing. In sociology, critical thinking also involves understanding multiple perspectives and recognizing bias, ideology, and power dynamics within social discourse (Oviana & Muhibbin, 2024). Despite its importance, integrating critical thinking effectively remains a challenge, especially in lecture based teaching formats that limit active engagement.

The integration of digital literacy, collaboration, and critical thinking is increasingly recognized as a holistic approach to modernizing sociology instruction (Oviana & Muhibbin, 2024). Studies by Nurfazri et al. (2024) suggest that when these elements are embedded cohesively, students exhibit higher levels of cognitive engagement, self-directed learning, and social responsibility. Moreover, research by Ilkay et al. (2025) indicates that integrative pedagogies can bridge the gap between formal education and real world problem solving. However, most existing studies are situated in Western contexts, and there remains a need for empirical research in diverse educational settings, particularly in developing countries.

This study builds upon this theoretical foundation by empirically investigating the outcomes of integrating digital literacy, collaboration, and critical thinking in a sociology education program in Indonesia. The review underscores the pedagogical potential of these three pillars and the need for context sensitive strategies to implement them effectively in university classrooms.

METHOD

Research Design

This study employed a quantitative descriptive research design to investigate the integration of digital literacy, collaboration, and critical thinking in 21st century sociology learning. The design aimed to measure student perceptions, and the effectiveness of the implemented learning model based on structured instruments. The focus was to quantify students' responses using statistical procedures and interpret the results in terms of their alignment with 21st century learning competencies.

The study adopted a cross-sectional survey approach, using a Likert-scale questionnaire as the primary data collection instrument. The instrument was developed based on validated constructs derived from previous studies on 21st century skills in higher education (Martínez-Bravo et al. 2022; Utaminingsih, 2023). The constructs were

categorized into three core dimensions: digital literacy, collaborative learning, and critical thinking.

Sample and Participants

The study involved 35 undergraduate students enrolled in the Sociology Education Study Program at a public university in Indonesia during the 2024–2025 academic year. The participants were selected using purposive sampling, considering their active enrollment in a sociology course that incorporated digital tools and group-based learning strategies.

The sample size was deemed sufficient for descriptive statistical analysis, as the minimum recommended size for pilot-scale educational research ranges between 30 and 50 participants (Creswell, 2014). Ethical clearance was obtained, and all participants gave informed consent prior to data collection.

Data Analysis Techniques

The data were analyzed using descriptive statistics, including mean (M), standard deviation (SD), and percentage of agreement (%). To assess internal consistency of the instrument, Cronbach's Alpha (α) was computed using the formula:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2}\right)$$

Interpretation of alpha values follows standard conventions: $\alpha \geq 0.9$ (excellent), $0.8 \leq \alpha < 0.9$ (good), $0.7 \leq \alpha < 0.8$ (acceptable) (George & Mallery, 2003). Additionally, to calculate the percentage of agreement on each item or category:

$$\text{Percentage} = \left(\frac{\text{Total Score Obtained}}{\text{Maximum Possible Score}}\right) \times 100$$

The analysis was conducted using SPSS version 26, enabling robust computation of reliability and descriptive trends.

RESULT AND DISCUSSION

Results

This study aimed to evaluate the integration of digital literacy, collaboration, and critical thinking in sociology learning among undergraduate students. Data were collected from 35 students using a Likert-scale questionnaire consisting of 30 items categorized into three main constructs. The descriptive statistical results are presented in Table 1.

Table 1. Descriptive Statistics of Students' Perceptions

Construct	Number of Items	Mean (M)	Standard Deviation (SD)	Percentage (%)	Interpretation
Digital Literacy	10	4.31	0.46	86.2%	Very High
Collaborative Learning	10	4.25	0.52	85.0%	Very High
Critical Thinking	10	4.37	0.48	87.4%	Very High
Average	**-**	**4.31**	**0.49**	**86.2%**	**Very High**

The data indicate that students' perceptions of all three 21st century competencies—digital literacy, collaboration, and critical thinking—were rated at a "very high" level. Digital literacy scored a mean of 4.31, reflecting the students' confidence in navigating digital tools and media in learning sociology. Collaborative learning also received strong responses (M = 4.25), showing that students actively engaged in group-based activities. Critical thinking received the highest score (M = 4.37), suggesting that the learning design successfully encouraged students to analyze, evaluate, and reflect on sociological concepts and issues.

Discussion

The results support the proposition that integrating 21st century skills into sociology education enhances students' engagement and cognitive development. The high score on digital literacy aligns with previous research emphasizing the role of digital competencies in fostering active and independent learning (Nurfazri et al., 2024; Oviana & Muhibbin, 2024). Students were able to utilize digital platforms for accessing articles, multimedia content, and conducting online discussions, reflecting increased digital fluency in academic contexts.

The findings on collaborative learning confirm the relevance of social constructivist principles in sociology education (Ilkay et al., 2025). Group projects, peer reviews, and cooperative investigations into social issues not only enhanced communication and

cooperation but also deepened understanding of sociological theories through discussion and role-sharing. These outcomes are consistent with Utaminingsih (2023) assertion that structured collaboration enhances critical reflection and shared knowledge construction.

The highest mean score in critical thinking indicates that the applied instructional design was effective in nurturing students' ability to question, evaluate, and synthesize social phenomena. As Padua (2025) and Ilkay et al. (2025) have argued, critical thinking is fundamental in social science education, enabling students to deconstruct dominant narratives, examine power relations, and propose alternative interpretations.

Taken together, these findings reinforce the importance of designing integrative, student-centered pedagogies that embed digital, collaborative, and reflective elements. Such integration prepares students not only for academic success but also for responsible and informed participation in a digital, pluralistic society.

Implications And Limitations

The positive outcomes of this study suggest that the intentional incorporation of 21st century skills into sociology curricula can be a catalyst for transformative learning. For educators, this implies a need to redesign learning environments that are digitally rich, socially interactive, and intellectually stimulating.

However, this study is limited by its small sample size and single-institution focus. Further research with larger, more diverse samples across multiple universities is needed to generalize findings. Moreover, longitudinal studies could better assess the long-term impact of such integrations on student learning outcomes and critical consciousness.

CONCLUSION

This study concludes that the integration of digital literacy, collaboration, and critical thinking into sociology learning significantly enhances students' engagement and acquisition of 21st century competencies. The findings reveal that students perceive the learning model as highly effective, with all three core constructs digital literacy (M = 4.31), collaborative learning (M = 4.25), and critical thinking (M = 4.37), reaching a "very high" level of acceptance and relevance. These results suggest that when educational environments are intentionally designed to incorporate digital tools, foster peer interaction, and encourage critical reflection, students are better equipped to navigate the complexities

of modern society. Moreover, this study reinforces the theoretical alignment between 21st century skill development and constructivist learning approaches, particularly within the context of sociology education. The results highlight the importance of moving beyond content delivery to embrace pedagogical strategies that empower students to think critically, work collaboratively, and use digital resources effectively. Future research is encouraged to expand the scope of this investigation across multiple disciplines and institutions, and to examine the longitudinal impact of such pedagogical models. Additionally, further exploration of teacher readiness and institutional support systems would provide a more holistic understanding of how 21st century learning frameworks can be sustainably implemented in higher education.

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