Jurnal Ilmiah Pertanian dan Peternakan (JIPPER)
ISSN 3031-5883, Vol 3, No 1, 2025, 39-48 https://doi.org/10.35912/jipper.v3i1.3320

Generation Z Agriculture: Agrarian Literacy as a Pillar of Economic and Ecological Sustainability

Irmayani Irmayani[1*], Jannatul Adnin[2], Irninthya Nanda Pratami Irwan[3]
Universitas Muhammadiyah Parepare, Parepare, Indonesia[1,2,3]
irmaumpar@yahoo.co.id[1], jannatuladn04@gmail.com[2], nandafapetrik2021@gmail.com[3]

Article History:
Received on 28 July 2024
1st Revision on 5 April 2025
2nd Revision on 14 July 2025
Accepted on 30 July 2025

Abstract
Purpose: This study aimed to explore the understanding of agricultural literacy among Generation Z (Gen Z) in Kecamatan Bacukiki Barat, Parepare, and to compare their understanding based on direct experience and literature.
Methodology/approach: This research utilizes a descriptive qualitative approach, employing data triangulation for validity testing. In-depth interviews and participatory observations were conducted to collect data from the research participants.
Results: The results show that Gen Z's agricultural literacy is moderate. Although they have a basic understanding of agricultural concepts, there is a lack of practical application. Understanding gained from direct experiences, such as involvement in agricultural activities or field visits, had a greater impact on encouraging real actions than knowledge gained solely from literature or written sources.
Conclusions: Strengthening practical experiences in agricultural education is essential to enhance Gen Z's understanding and participation in the agricultural sector. This can be achieved through internship programs, field practice, and collaboration with local farmers and educational institutions.
Limitations: The research is limited to participants in Kecamatan Bacukiki Barat, Parepare, which may limit the generalization of the findings to other regions or populations.
Contributions: This study contributes to understanding the agricultural literacy of Gen Z and emphasizes the importance of practical learning experiences for improving engagement and sustainability in the agricultural sector.

Keywords: *Agriculture Literacy, Ecology, Economy, Gen Z*

How to Cite: Irmayani, I., Adnin, J., & Irwan, I. N. P. (2025). Generation Z Agriculture: Agrarian Literacy as a Pillar of Economic and Ecological Sustainability. *Jurnal Ilmiah Pertanian dan Peternakan,* 3(1), 39-48.

1. Introduction

The emergence of the digital era and rapid technological advancements have given birth to a new generation, Generation Z, shaped by the forces of this transformation. This generation, born between the mid-1990s and the late 2000s, has the potential to bring significant changes in various sectors, including agriculture (Awaludin, Maryam, & Fadliyanti, 2024). Generation Z, growing up in the digital and fast-paced era, has great potential to bring significant changes to the agricultural sector (Awaludin et al., 2024; Wardani, 2024).

However, their involvement and understanding of agricultural aspects need to be studied further to ensure their sustainable contribution to supporting the sustainability of this sector. Kecamatan Bacukiki Barat was chosen as the focus of the study because of its unique socio-cultural characteristics (Wirya et al., 2026). Local practices and values can play an important role in how agriculture is carried out and accepted by the local community. Understanding the agricultural literacy of Generation Z in this

sociocultural context is essential for formulating appropriate and sustainable solutions (Sitompul et al., 2024).

Challenges such as climate change, urbanization, and shifting market demands are serious threats to agricultural sustainability (Saleem et al., 2025). Therefore, involving Generation Z, which has great potential for the application of new technologies and innovations, is key to maintaining the resilience of this agricultural sector. Before that, it is important to measure the extent of Generation Z's agricultural literacy and how it can positively impact economic and ecological sustainability in Kecamatan Bacukiki Barat (Sitompul et al., 2024).

2. Literature Review and Hypothesis Development

Mokhtar, Izhar, Zaini, and Hussin (2022) acknowledge the importance of digital literacy among farmers as a key factor in promoting sustainable food security. In the context of the ever-growing world population, with a significant proportion living in urban areas, the need for effective agricultural practices and policies is becoming increasingly crucial. Digital literacy refers to the ability to use information and communication technology effectively and efficiently. In the agricultural sector, digital literacy allows farmers to access up-to-date information on weather, market prices, new agricultural techniques, and technological innovations that can enhance productivity and efficiency (Arangurí, Mera, Noblecilla, & Lucini, 2025; Fharaz, Kusnadi, & Rachmina, 2022).

Wang, Mao, Zhou, and Li (2025) highlights that farmers with high digital literacy tend to be more capable of adopting sustainable farming practices, which in turn can improve food security at both local and global levels (Wang et al., 2025). Strengthening digital literacy among farmers is a priority in the global food security strategy. With increasing urbanization, agricultural land is shrinking, and the challenge of meeting global food demand is growing (Arangurí et al., 2025). Therefore, efficient and sustainable farming practices are crucial in this regard. Digital literacy provides farmers with the tools to adapt to these changes, such as through the use of precision farming applications that enable more effective land monitoring and management (Aranguri, Mera, Noblecilla, & Lucini, 2025).

This study also shows that digital literacy can help farmers access broader markets and obtain better prices for their products. With digital technology, farmers can reduce their reliance on intermediaries, thus increasing their income and sustainability (Setiawan, 2024). This study further investigates how digital literacy among farmers in Kecamatan Bacukiki Barat, Parepare, can be improved and how it can contribute to sustainable farming practices and food security (Mokhtar, Izhar, Zaini, & Hussin, 2022). This study also examines the role of Generation Z in leveraging digital literacy for agricultural innovation, given their potential as digital natives who can bring significant changes to this sector (Halawa, 2024). Therefore, this research aims to provide new insights that can be used to formulate more effective policies and strategies to improve digital literacy and agricultural sustainability in the region (Xu, Radzi, Liu, & Sieng, 2026).

Imran and Ferdous (2025) highlighted the importance of optimizing Generation Z's involvement in the agricultural sector through the introduction of technology and collaborative consumption. However, this study delves deeper into understanding the agricultural literacy of Gen Z in the socio-cultural context of Kecamatan Bacukiki Barat, Parepare. Generation Z, born between the mid-1990s and the late 2000s, has emerged as a transformational force in the agricultural sector (Leatemia, Darsono, & Irianto, 2024). They are known as digital natives with innate skills in technology, such as data analytics, precision farming, and automation, which have the potential to change traditional farming practices. Their digital skills not only enhance production efficiency but also support sustainable farming practices such as resource sharing and waste reduction (Abdan, 2025; Febliza, Kadarohman, Aisyah, & Abdullah, 2025).

The integration of Generation Z into the agricultural workforce is challenging due to differing expectations, including the desire for work-life balance and the social impact of their work (Apriyani, Jayanti, & Nearti, 2025; Mahardika, Ingarianti, & Zulfiana, 2022). Previous studies have shown that strategies that align technology with local values can increase the acceptance and use of innovations in

the agricultural sector (Hermiliana, Tupas, & Maksiri, 2025). This study also explores how Generation Z can address challenges such as climate change and urbanization through the application of technology in agricultural practices. By understanding the local sociocultural context, this study is expected to provide in-depth insights into how to optimize the agricultural literacy of Generation Z to support economic and ecological sustainability in this region (Nasution et al., 2024).

The American Farm Bureau Foundation for Agriculture (2019) states that agricultural literacy is the ability of farmers to understand the relationships between farmers and the environment, food, fiber, energy, animals, lifestyle, economics, and technology. Furthermore, Meischan, D.L., & Trexler, C.J. in the National Center for Agricultural Literacy (2019) state that agricultural literacy relates to knowledge and understanding of science-based and agriculture-based concepts and processes necessary for personal decision-making, participation in civic and cultural affairs, and enhancing economic productivity (Riadi, Rohmah Nurazizah, Wakano, & Fadilah, 2023).

Bouteska, Sharif, Bhuiyan, and Abedin (2024) mention that climate fluctuations (climate change) lead to instability in food availability. However, several factors also contribute to the decline in agricultural productivity, including the widespread unsustainable land management, which causes land degradation over time, in addition to the increasingly unpredictable weather and climate fluctuations. Consequently, in the late years (2018/2019), many farmers experienced a decline or failure in their harvests (both in quantity and quality). The complex dynamics of farmers' issues are empirically dominated by anthropogenic activities that are unsustainable in their management (Meirisa, Arafah, & Rakhmat, 2024).

3. Research Methods

This study was conducted in Kecamatan Bacukiki Barat, Parepare City. The location was chosen purposively, considering that it has the highest number of educational institutions compared to other sub-districts. Thus, the target participants in this study were Generation Z from various backgrounds (Salman, 2024). This diversity has the potential to yield more accurate results. Furthermore, part of Bacukiki Barat has undergone land-use changes, which helps researchers observe Generation Z's responses that are indirectly related to their level of agricultural literacy. The research will be conducted from October 2023 to January 2024.

3.1 Type of Research

This was a descriptive qualitative study. Descriptive research is a method used to describe or provide an overview of the object being studied based on the data or samples that have been collected as they are, without making general conclusions (Sugiyono, 2017). Qualitative research is a method used to describe and analyze phenomena, events, social activities, attitudes, beliefs, perceptions, and individuals or groups.

3.2 Sampling Technique

Sampling aims to obtain a descriptive picture of the characteristics of the observational unit included in the data and to generalize and estimate population parameters (Yudhistira, Suprapto, & Sulmartiwi, 2023). The snowball technique is used to identify, select, and sample within a network or continuous chain of relationships. In this study, there were seven participants, starting with two students with an agricultural background, who then identified the next participants, five students without an agricultural education background.

3.3 Data Collection Techniques

The data collection techniques employed in this study were interviews, observations, and literature reviews. Interviews were conducted with key stakeholders to gain in-depth insights into their experiences and perspectives. Observations allowed the researchers to gather real-time, contextual data, while the literature review provided a theoretical foundation and helped contextualize the findings within existing research.

3.3.1 Observation

Observation is the process of observing and examining a behavior to obtain information about the object being used as a variable. This method allows researchers to gain a direct understanding of the phenomenon under study by observing its occurrence in natural settings. Observations can be structured or unstructured, depending on the research design, and can involve both participant and non-participant roles. By capturing real-time data, observations provide insights that might not be accessible through interviews or questionnaires alone, offering a deeper, more nuanced perspective of the subject's behavior in its natural environment.

3.3.2 Interview

An interview is a conversation between two parties with a specific purpose, resulting in answers that are recorded or documented by the interviewers. Interviews are often used in qualitative research to gather detailed information about individuals' experiences, opinions, or perceptions on a particular topic. This process allows the interviewer to ask follow-up questions and clarify responses, making it an interactive method of data collection. Interviews can be structured, semi-structured, or unstructured, depending on the level of flexibility required for the interview. This method helps researchers gain in-depth insights and ensures a comprehensive understanding of the subject matter being explored.

3.3.3 Documentary Study

Documentary study is a method of collecting qualitative data by analyzing documents originating from the subject or others related to the subject. Documentary studies aim to describe the subject's perspective through media and other non-verbal documents directly created by the subject in question. This method is valuable for understanding historical contexts, societal norms, and cultural trends through existing records, such as reports, letters, photographs, and archival materials. By analyzing these documents, researchers can uncover patterns, identify underlying themes, and gain insights into the subject's behavior, beliefs, or practices, thereby enhancing the depth and breadth of qualitative analysis.

3.3.4 Validity Testing

The triangulation method was used to test the validity of the research results. The triangulation used in this study was source triangulation. Source triangulation is the verification of data obtained from multiple sources, which are then described and categorized based on informants' perspectives. The analyzed data were then validated through member checks with the data sources. This method ensured the reliability of the findings by cross-checking information across different informants or data sources. Triangulation helps identify inconsistencies or biases in the data and enhances the credibility of research by offering a more comprehensive view of the studied phenomenon. It also improves the robustness of the conclusions drawn from these data.

4. Results and Discussions

4.1 Respondent Characteristics

The characteristics of the respondents in this study will explain the results of the interviews, including their experience, majors, and ages, for each student from different campuses in Kecamatan Bacukiki Barat, Parepare City. The respondent characteristics data are explained as follows:

Table 1. Respondent classification based on field experience

No.	Experience	Number of Respondents	Percentage (%)
1	Field Experience	5	71.43%
2	No Field Experience	2	28.57%
Total		7	100%

The data in Table 1 shows that five respondents, or 71.43% of the total respondents, have had direct involvement in agricultural activities, while two respondents, or 28.57%, have never been directly involved in agricultural activities.

Table 2. Respondent classification based on major

No.	Education Level	Number of Respondents	Percentage (%)
1	Agriculture	3	42.86%
2	Non-Agriculture	4	57.14%
Total		7	100%

Table 2 shows that the number of respondents with an education in the field of agriculture is three (42.86%), while the respondents with an education in non-agriculture fields amount to 4 people or 57.14%). This distribution was used to observe the similarities and differences in perspectives, despite their different academic backgrounds. By comparing these two groups, this study aims to examine how education in agriculture versus non-agriculture influences respondents' views on agricultural literacy and sustainability.

In this study, seven informants were selected using purposive sampling (intentional selection), followed by snowball sampling, where the first informant directed the researcher to subsequent informants. This method was applied to ensure that the selected informants had relevant experiences or knowledge that could contribute to the research objectives. The purposive sampling technique ensured that the informants were well-suited to provide valuable insights into the study's focus.

The informants in this study were members of Generation Z who resided in Kecamatan Bacukiki Barat and Kecamatan Soreang, Parepare City (Hendrastomo & Januarti, 2023). The characteristics of these informants include their educational background, career opportunities, experience, educational status, place of origin, age, family environment socialization, and exposure to technology (Arum, Zahrani, & Duha, 2023). These factors play a crucial role in understanding how they perceive and engage with agriculture, technology, and sustainability in their local contexts. By examining these attributes, this study aims to identify the key determinants of agricultural literacy among Generation Z.

Table 3. Informant identity

No.	Name	Identity
1.	ST Nurul Hidayah	Age: 21 Years, Address: Lapadde KM7, Origin: Pinrang, Education: S1 UMPAR - Agribusiness
2.	Andi Abdul Malik	Age: 23 Years, Address: Tegal Parepare, Origin: Parepare, Education: S1 IAIN - Islamic Economics
3.	Ahmad Dzaki	Age: 19 Years, Address: Tegal Parepare, Origin: Soppeng, Education: S1 Umpar - Agribusiness
4.	Muhammad Ikbal	Age: 18 Years, Address: Tegal Parepare, Origin: Parepare, Education: S1 ITH - Information Technology
5.	Jessica	Age: 18 Years, Address: Parepare, Origin: Medan, Education: S1 ITH - Information Technology
6.	Namrah	Age: 21 Years, Address: Tegal Parepare, Origin: Parepare, Education: S1 UMPAR - Agrotechnology
7.	Suhrawardiah	Age: 20 Years, Address: Parepare, Origin: Pinrang, Education: S1 UNM - English Education

4.2 Discussions

4.2.1 Agricultural Literacy of Generation Z in Parepare

Generation Z, typically born between the mid-1990s and the early 2010s, grew up in a highly connected digital environment, and their exposure to technology from an early age has shaped their learning and communication habits. Generation Z members are often referred to as 'digital natives' because of their natural talent in using digital tools and technology. Since childhood, they have been accustomed to devices such as smartphones, tablets, and computers, which provide easy access to information and communication. This has changed the way students access knowledge, interact with others, and develop skills.

Generation Z tends to seek information independently through the Internet, using various digital platforms for both formal and informal learning. They prefer flexible, interactive, and technology-based learning methods such as online courses, educational videos, and learning apps. Their digital skills encompass software use and the ability to understand and utilize various social media platforms, messaging apps, and collaborative tools. However, despite their proficiency in using technology, the main challenge for Generation Z is to use this technology wisely, including in terms of selecting credible and relevant information for their personal and professional development (Bilonozhko & Syzenko, 2020).

Widespread access to information through technology has uniquely shaped their mindsets and behaviors. This study aimed to assess the level of agricultural literacy among Generation Z in Kecamatan Bacukiki Barat, Parepare City, focusing on economic, ecological, and sociocultural aspects. In this context, the research not only measures the basic knowledge of agriculture but also explores how technology influences their interaction with the agricultural sector. Knowledge of sustainable farming practices, environmental impacts, and sociocultural engagement is also a key focus. Through this research, new patterns are expected to emerge that can help improve the agricultural literacy of Generation Z, particularly in supporting the sustainability of the agricultural sector in the region. Furthermore, the results of this study are expected to provide a basis for developing more effective educational programs to increase awareness and involvement in sustainable agriculture.

4.2.2 Economic Aspects

In this study, it was found that the agricultural literacy of Generation Z in Kecamatan Bacukiki Barat and Soreang in the economic aspect of agriculture was at a moderate level. Generation Z understands agricultural economics, including financial management and funding allocation strategies. Ahmad Dzaki, a 19-year-old student, stated: "I once sent coconut shells from Sulawesi to Java to be made into briquettes. This demonstrates how agricultural waste can generate money. I manage finances by differentiating between capital and profit; the initial payment from the consumer is directly used to pay the supplier, while the profit is transferred when the goods are at the port and ready to be shipped." In general, Gen Z in Parepare sees economic opportunities in agriculture and actively thinks about agricultural activities. Nurul, a 20-year-old agricultural student, also added: "I am able to see new economic opportunities in the agricultural sector and understand the concept of agribusiness and its supply chain about 85%."

4.2.3 Ecological Aspects

Ecologically, the research found that Generation Z's understanding of the environmental impact of agriculture is still low. Many acknowledge the lack of an in-depth understanding of how agriculture impacts the environment. However, there is an awareness of the need for innovation to address climate change issues, partly caused by agricultural practices. Through data and interviews, the results show that Generation Z's understanding of the ecological aspects of agriculture is relatively low. Informants acknowledged their lack of in-depth knowledge about how agriculture impacts the environment, as expressed by Jessica. Furthermore, the view on agricultural ecology focuses on the environment, as stated by Namra, one of the informants, who emphasized the role of the government and the younger generation in addressing climate change, one of the causes of which is agriculture.

Namra also stressed the importance of continuously innovating to address climate change issues, hoping that technology and new approaches in agriculture could help reduce the negative environmental impacts. However, despite awareness of the importance of innovation, the major challenge is the lack of practical understanding of how agriculture can adapt to climate change. Some informants suggested the need for deeper training and education on sustainable agriculture and the long-term impacts of agricultural practices on ecosystems. They also emphasized the active role of the younger generation in advocating for more environmentally friendly policies and implementing more efficient technologies for managing natural resources. Therefore, to address ecological challenges in agriculture, collaboration between the government, society, and education sector is needed to enhance ecological literacy among Generation Z.

4.2.4 Social and Cultural Aspects

This research also highlights the socio-cultural literacy of Generation Z in Kecamatan Bacukiki Barat and Soreang. Generation Z understands how agriculture is influenced by and impacts local sociocultural dynamics. Malik, a 23-year-old informant, stated that social and cultural factors in Parepare are more trade-oriented, making it reasonable for the city to be perceived as a transit area, especially as agricultural activities are declining due to land conversion into residential areas, although some residents still practice small-scale hydroponic farming, while the city remains strategically positioned as a hub connecting surrounding agricultural districts.

This research underscores the importance of integrating cultural values into the development of the agricultural sector and shows that sociocultural factors play a crucial role in shaping agricultural practices in the community. Comparison of Agricultural Literacy Levels in Generation Z: Literature vs Experience. This study also compares the agricultural literacy of Generation Z using two approaches: literature and experience. Dzaki, 19 years old, stated that he acquired most of his agricultural knowledge from books and social media content. Malik, 22 years old, added that he often obtained agricultural information from educational content on social media platforms.

Although both informants relied on similar information sources, they acknowledged that practical knowledge of agriculture is more easily understood through direct experience. Dzaki and Malik agreed that, while social media information is useful, direct involvement in agricultural activities, such as field visits or internships, would deepen their understanding of the sector. Thus, this study emphasizes the importance of combining theoretical and practical literacy to enhance Gen Z's understanding of agriculture. In addition to the knowledge gained from the literature, agricultural knowledge can also be directly obtained through personal experiences. Jessica, an 18-year-old informant, explained that her agricultural knowledge is derived from personal experience and observation of her parents, who are farmers in Medan, including practices such as pest control and planting techniques.

Jessica also mentioned that she has a solid understanding of agriculture, including the cultivation of perennial plants like cloves, pepper, and cocoa, as well as fertilization techniques such as MPK and pest control, all of which align with her agrotechnology studies. She further explained that her education involved learning about rice field irrigation and gaining direct field experience. Additionally, growing up in a village in Enrekang with many food crops, she frequently visited farms, giving her a foundational knowledge of agriculture even before pursuing a degree in agrotechnology. This comparison shows that Generation Z's agricultural literacy is influenced by both formal knowledge from the literature and direct field experience. The findings of this study provide a richer and more contextual view of agricultural literacy and its implications for economic and ecological sustainability in the region. Generation Z in Parepare City has great potential in the agribusiness sector because of their creativity, innovation, and ability to utilize digital technology. They also tend to compare various sources before making decisions, making sustainable agriculture increasingly dependent on their hands. Their ability to quickly and effectively search for information through digital platforms allows them to access knowledge about modern agricultural techniques, sustainability, and innovations that can be applied to this sector.

Furthermore, this generation is more open to change and experimentation with new agricultural approaches. By leveraging technology, production efficiency can be improved and Ikbal, a student, explained that at the beginning of his studies, he had three ideas for his final project, as ITH has replaced theses with projects. One of the ideas he suggested was developing a platform or app to ensure fair pricing for farmers, but another project theme was ultimately chosen. Additionally, as an inspiration ambassador, Ikbal highlighted the environmental issue of land conversion, noting that forests, which once provided air and water regulation, have been transformed into plantation lands, contributing to landslides and floods. He emphasized that large trees play a crucial role in water absorption and stabilizing soil. Scientific facts presented by Aditya Alta (Head of Agriculture Research, Center for Indonesian Policy Studies) and Sri Noor Chalidah (Food System Analyst, WRI Indonesia) show that although public policy observers have made efforts to adopt a new approach to Indonesia's agricultural system, many challenges remain in the field.

For example, the food estate policy has the potential to negatively impact the environment, such as greenhouse gas emissions and the degradation of protected forests. These challenges are even more relevant given the urgent need to implement sustainable agriculture that aligns with environmental sustainability. With their high ecological awareness, Generation Z can become agents of change by advocating for more environmentally friendly and sustainable policies. They can use technology to monitor, manage, and innovate more environmentally friendly farming practices, which can, in turn, reduce the negative impact of policies that do not support sustainability.

5. Conclusions

5.1 Conclusion

The research found that agricultural and digital literacy among Generation Z in Kecamatan Bacukiki Barat, Parepare City, have significant potential for further development. Generation Z in this area demonstrates a good understanding of the economic aspects of agriculture, although improvements are needed in the ecological and socio-cultural aspects. They are aware of the importance of innovation and the use of technology in agriculture, but a deeper understanding of the environmental impact of agricultural practices still needs to be developed. Generation Z also shows a high adaptability to digital technology, which can be used to improve productivity and efficiency in the agricultural sector. Digital literacy allows farmers to access up-to-date information on agricultural techniques, weather, and market prices, which can help them adopt sustainable farming practices. Technology also provides opportunities to reduce dependence on intermediaries, which can directly increase farmers' income.

However, despite the awareness of the importance of digital innovation in agriculture, the main challenge faced by Gen Z in Kecamatan Bacukiki Barat is their limited understanding of sustainable farming practices and long-term environmental impacts. Therefore, there is a need to enhance agricultural literacy, especially in ecological and socio-cultural aspects, so that they can better understand and apply sustainability concepts. It is important to involve the younger generation in education based on technology and sustainable-agriculture. Collaboration between Generation Z, the government, and agricultural industry stakeholders can accelerate the adoption of more environmentally friendly technologies and strengthen food security and sustainability in the agricultural sector in this region. Moving forward, it is essential to strengthen their digital and agricultural literacy to ensure that they can play an active role in supporting the sustainability of the agricultural sector.

5.2 Research Limitations

This study is limited to participants from the Bacukiki Barat District, Parepare, which may affect the generalizability of the findings to other regions or populations. The sample size of only seven respondents, although purposively and snowball sampled, may not fully represent the diverse perspectives of Generation Z on agricultural literacy across different geographical locations. Furthermore, this research primarily used qualitative methods (interviews and observations), which may not provide quantifiable data that could further substantiate the findings.

5.3 Suggestions and Directions for Future Research

To enhance Generation Z's understanding of agriculture, it is suggested that the agricultural education system place greater emphasis on practical experiences, such as internship programs, field visits, and direct interaction with farmers. This would strengthen their understanding of agricultural practices and bridge the gap between theoretical knowledge and real-world application. Additionally, local governments should formulate policies that foster the development of agricultural literacy among youth, especially Generation Z, with a focus on increasing access to digital technology and eco-friendly farming practices to promote sustainability. Collaboration between educational institutions and local farmers should also be encouraged to create hands-on training programs that provide the skills needed to implement sustainable agricultural practices.

Future research could broaden the geographic scope by comparing agricultural literacy in various regions with different cultural and socio-economic backgrounds. This would help understand regional differences and tailor educational strategies accordingly. Furthermore, a longitudinal study assessing the impact of agricultural education programs over time could provide more in-depth insights into the

long-term effects on career choices and involvement in the agricultural sector. Future studies could also adopt a quantitative approach to assess agricultural literacy among Generation Z on a larger scale, enabling the results to be generalized and offering a broader understanding of the factors influencing agricultural education.

References

Abdan, M. (2025). Peran edukasi pertanian berbasis teknologi dalam meningkatkan minat generasi z terhadap pertanian modern (modern farming). *Agrifo: Jurnal Agribisnis Universitas Malikussaleh, 10*(2). doi:https://doi.org/10.29103/ag.v10i2.22032

Apriyani, S., Jayanti, N., & Nearti, Y. (2025). Strategi Peningkatan Pendapatan Petani Karet (Hevea Brasilinsies) yang dipengaruhi Fluktuasi Harga di Desa Lubuk Rengas Kecamatan Rantau Bayur Kabupaten Banyuasin. *Jurnal Ilmiah Pertanian dan Peternakan, 2*(2), 97-111. doi:https://doi.org10.35912/jipper.v2i2.5366

Arangurí, M., Mera, H., Noblecilla, W., & Lucini, C. (2025). Digital literacy and technology adoption in agriculture: A systematic review of factors and strategies. *AgriEngineering, 7*(9), 1-29. doi:https://doi.org/10.3390/agriengineering7090296

Arum, L., Zahrani, A., & Duha, N. (2023). Karakteristik Generasi Z dan Kesiapannya dalam Menghadapi Bonus Demografi 2030. *Accounting Student Research Journal, 2*, 59-72. doi:https://doi.org/10.62108/asrj.v2i1.5812

Awaludin, M., Maryam, S., & Fadliyanti, L. (2024). Analysis of the Determining Factors of Generation Z's Interest in Working in the Agricultural Sector in Bima Regency. *Jurnal Social Economic of Agriculture, 13*(1), 44-57. doi:https://doi.org/10.26418/jsea.v13i1.79056

Bilonozhko, N., & Syzenko, A. (2020). Effective reading strategies for generation z using authentic texts. *Arab World English Journal (AWEJ) Special Issue on the English Language in Iraqi Context*. 121-130. doi:https://dx.doi.org/10.24093/awej/elt2.8

Bouteska, A., Sharif, T., Bhuiyan, F., & Abedin, M. Z. (2024). Impacts of the changing climate on agricultural productivity and food security: Evidence from Ethiopia. *Journal of cleaner production, 449*, 1-19. doi:https://doi.org/10.1016/j.jclepro.2024.141793

Febliza, A., Kadarohman, A., Aisyah, S., & Abdullah, N. (2025). Generation Z and the Use of Digital Technology: A Review from 2014 to 2023. *Jurnal Pendidikan Sains Indonesia, 13*(1), 53-67. https://doi.org/10.24815/jpsi.v13i1.40797

Fharaz, V. H., Kusnadi, N., & Rachmina, D. (2022). Pengaruh literasi digital terhadap literasi E-marketing pada petani. *Jurnal Agribisnis Indonesia (Journal of Indonesian Agribusiness), 10*(1), 169-179. doi:https://doi.org/10.29244/jai.2022.10.1.169-179

Halawa, D. N. (2024). Peran teknologi pertanian cerdas (smart farming) untuk generasi pertanian Indonesia. *Jurnal Kridatama Sains dan Teknologi, 6*(2), 502-512. doi:https://doi.org/10.53863/kst.v6i02.1226

Hendrastomo, G., & Januarti, N. E. (2023). The Characteristics of Generation Z Students and Implications for Future Learning Methods. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 9*(2), 484–496. doi:https://doi.org/10.33394/jk.v9i2.7745

Hermiliana, H., Tupas, G.-A., & Maksiri, W. (2025). Is Smart Farming the Future of Sustainable Agriculture? Insights from a Village-Level Innovation Adoption. *Journal of Educational Technology and Learning Creativity, 3*(1), 175-184. doi:https://doi.org/10.37251/jetlc.v3i1.1849

Imran, M. N. U., & Ferdous, J. (2025). Cultivating Connections: Leveraging Digital Innovation to Engage Gen Z in Agricultural Marketing. *Available at SSRN 5171775*. 1-24. doi:https://doi.org/10.2139/ssrn.5171775

Leatemia, F. T., Darsono, D., & Irianto, H. (2024). The Interest of Generation Z Students at the Faculty of Agriculture, UNS, to Work in the Agricultural Sector and Factors Influencing IT. *Jurnal Hexagro, 8*(2), 104-116. doi:https://doi.org/10.36423/hexagro.v8i2.1557

Mahardika, A. A., Ingarianti, T., & Zulfiana, U. (2022). Work-life Balance pada Karyawan Generasi Z. *Collabryzk Journal for Scientific Studies, 1*(1), 1-16. doi:https://doi.org/10.58959/cjss.v1i1.8

Meirisa, D., Arafah, E., & Rakhmat, A. (2024). Analisis Faktor Pendorong dan Penarik yang Mempengaruhi Keputusan Konsumen Membeli Produk Pertanian di Modern Market Kota Palembang. *Jurnal Ilmiah Pertanian dan Peternakan, 2*(1), 9-21. doi:https://doi.org/10.35912/jipper.v2i1.2689

Mokhtar, W., Izhar, T. A. T., Zaini, M. K., & Hussin, N. (2022). The Importance of Digital Literacy Skills among Farmers for Sustainable Food Security. *International Journal of Academic Research in Progressive Education and Development, 11*(1), 235-246. doi:https://doi.org/10.6007/IJARPED/v11-i1/12104

Nasution, F. A., Muthmainnah, M., Nanda, S. A., Fadliani, F., Ridwan, T. M., & ZA, N. (2024). Peran Internet Of Thing (Iot) Dalam Perkembangan Teknologi Untuk Petani Garam Tambak Ujung Pusong Jaya. *Jurnal Malikussaleh Mengabdi, 3*(2), 410-420. doi:https://doi.org/10.29103/jmm.v3i2.20428

Riadi, S., Rohmah Nurazizah, G., Wakano, D., & Fadilah, R. (2023). Effect of Urea Application on Corn Productivity: A Meta-Analysis. *Jurnal Ilmiah Pertanian dan Peternakan, 1*(1), 27-34. doi:https://doi.org/10.35912/jipper.v1i1.2567

Saleem, A., Anwar, S., Nawaz, T., Fahad, S., Saud, S., Ur Rahman, T., . . . Nawaz, T. (2025). Securing a sustainable future: the climate change threat to agriculture, food security, and sustainable development goals. *Journal of Umm Al-Qura University for Applied Sciences, 11*(3), 595-611. doi:https://doi.org/10.1007/s43994-024-00177-3

Salman, I. N. (2024). Analysis of acceptance and use of the agree mart mobile groceries marketplace application using the UTAUT-3 Model in Indonesia. *Jurnal Ilmiah Pertanian dan Peternakan, 2*(1), 23-45. doi:https://doi.org/10.35912/jipper.v2i1.5311

Setiawan, H. A. (2024). Pengaruh literasi digital terhadap pemanfaatan e-commerce pada hasil pertanian. *Jurnal Kolaboratif Sains, 7*(5), 1598-1607. doi:https://doi.org/10.56338/jks.v7i5.5282

Sitompul, H. S., As'ad, O. A., Nasution, N., Yanti, M. E., Surbakti, S., & Maulina, I. (2024). Edukasi Mengenai Sektor Pertanian Kepada Generasi Z Dalam Mendukung Sustainable Development Goal (SDGs). *Pengabdian Pendidikan Indonesia, 2*(1), 23-27. doi:https://doi.org/10.47709/ppi.v2i01.4334

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.

Wang, H., Mao, Y., Zhou, M., & Li, X. (2025). Farmers' digital literacy and its impact on agricultural green total factor productivity: Evidence from China. *Sustainability, 17*(20), 1-26. doi:https://doi.org/10.3390/su17209255

Wardani, G. T. (2024). Potensi Gen Z dalam Pengembangan Teknologi Berbasis Sistem Pertanian Presisi Guna Meningkatkan Produktivitas Pertanian di Indonesia. *Flora: Jurnal Kajian Ilmu Pertanian dan Perkebunan, 1*(2), 22-31. doi:https://doi.org/10.62951/flora.v1i2.52

Wirya, G. N. A. S., Dewi, N. L. M. I. M., Utari, N. K. S., Arisena, G. M. K., Fitriani, Y., Dharmadiatmika, I. M. A., Wulandari, N. K. P. (2026). Virtual Reality dan Kultur In-Vitro Sebagai Media Edukasi Meningkatkan Minat Generasi Z Pada Pertanian. *ABDI MOESTOPO: Jurnal Pengabdian Pada Masyarakat, 9*(1), 1-13. doi:https://doi.org/10.32509/abdimoestopo.v9i1.6008

Xu, A., Radzi, N. A. M., Liu, Y., & Sieng, L. W. (2026). The Role of Digital Literacy in Agricultural Technology Adoption and Efficiency: A Systematic Literature Review. *Sustainability, 18*(2), 1-25. doi:https://doi.org/10.3390/su18021138

Yudhistira, A., Suprapto, H., & Sulmartiwi, L. (2023). Influence of addition surimi wastewater to macronutrient content (nitrogen, phosphor, and potassium) of gracilaria sp. Liquid organic fertilizer. *Jurnal Ilmiah Pertanian dan Peternakan, 1*(1), 19-25. doi:https://doi.org/10.35912/jipper.v1i1.2601