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Integration of Technology and Art through Smartphone Photography Classes for Community Empowerment

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ABSTRACT (9 pt)

Objective: This study aimed to investigate the integration of technology and art in community-based nonformal education through smartphone photography classes, with the objectives of (1) strengthening digital skills, (2) fostering creative expression, (3) enhancing visual literacy, and (4) opening economic opportunities for participants. This study specifically explores how photography training using mobile devices can function as a means of empowerment in community education. *Method:* A qualitative descriptive approach was employed, focusing on Kleas Moto Teh Ina, an online photography training community utilising mobile devices. Data were collected through document analysis, participant observation, and in-depth interviews, and thematic analysis was conducted to identify key trends, dynamics, and program impacts. *Results:* The results demonstrate that participants (1) significantly improved their technical photography skills, particularly in lighting, composition, and photo editing, (2) alongside advancements in digital literacy and self-confidence, and (3) many participants translated these skills into creative economic activities, including professional content creation and promotion of micro, small, and medium enterprises (MSMEs). *Novelty:* The novelty of this study lies in presenting smartphone-based photography education as a sustainable and inclusive empowerment model. It contributes to bridging digital literacy gaps while offering a pragmatic and innovative approach to community learning in the digital age.

INTRODUCTION

Community education, as an integral component of Indonesia's national education system, plays a strategic role in expanding access to and improving the quality of life of people outside the formal education system. According to Law No. 20 of 2003 on the National Education System, community or nonformal education is designed to provide relevant and flexible services, ranging from literacy and life skills to empowerment programs for youth, women, families and communities. In this regard, community education serves not only as a complement to formal education but also as a transformative space for social inclusion and empowerment. (National Education System Law, 2003)The development of the times demands education to continue to adapt. The rapid transition from industrialization to digitalization, marked by the Fourth Industrial Revolution (IR 4.0) and the anticipated Society 5.0, demands that the national education system, including non-formal education, develop a more progressive approach. The 21st century emphasizes the importance of essential skills such as digital literacy, creativity, and critical thinking; therefore, the implementation of community education needs to adopt innovative and adaptive learning methods to technological developments. In this context, the widespread availability of smartphones presents significant opportunities as well as new challenges. Smartphones not only change the way individuals communicate and access information, but also open more interactive and empowering learning pathways.

One promising area of technology and art integration in community education is smartphone-based photography, which has the potential to promote visual literacy, strengthen digital skills, and encourage the formation of collective identities (Xu et al., 2022). In the context of education, several studies affirm the advantages of smartphones

in increasing learning flexibility, collaboration, and accessibility (Ibragimov et al., 2023). In addition, in photography education, smartphones have been shown to be effective in stimulating creativity and improving participants' understanding of visual elements, such as composition, lighting, and color (Montalvo-Man et al., 2022). However, the integration of technology in nonformal education is not yet fully optimal. Some of the main challenges include unequal access to quality devices, low levels of digital literacy among some students, and resistance to the adoption of new technologies, both from participants and facilitators (Purmayanti, 2022). To address these challenges, technology-based learning models designed in an inclusive, participatory, and context-sensitive manner are needed so that learning becomes relevant and effective.

The Moto Teh Ina class is a practical example of an integrated model. The program is a community-based online photography training program that empowers women and youth through a digital platform with intensive guidance from professional trainers. The applied participatory approach emphasizes collaboration, creativity, and relevance to everyday life. Participants are encouraged to utilize their photography skills for a variety of purposes, from promoting small businesses and documenting community events to expressing their cultural identity. The results of the program demonstrate the transformative potential of smartphone-based photography in community education. Participants not only improved their technical skills and confidence but also became more active in utilizing digital platforms to produce and share meaningful visual content. Some participants even developed new competencies for economic purposes, such as creating promotional content for micro, small, and medium enterprises (MSMEs). Simultaneously, their contributions to documenting local cultural activities and community narratives affirm the social function of nonformal education, in which learners are positioned as active producers of knowledge and culture (Ferrer-Fons et al., 2022). Thus, art and technology intersect to raise awareness of social realities through visual narratives (Valizadeh-Haghi et al., 2023).

Based on this background, this study aims to explore the integration of technology and art through smartphone-based photography classes as a form of community empowerment. Specifically, it addresses the following research questions: (1) How are smartphone-based photography classes designed and implemented as a model of nonformal education? (2) What impact do such classes have on participants digital literacy, creative expression, and economic opportunities? (3) What challenges and enabling factors emerge in the process of implementing smartphone-based photography education? By answering these questions, this study contributes to the theoretical development of community education in the digital era and provides practical insights for optimizing similar programs in diverse local contexts.

RESEARCH METHOD

This study aims to conduct an in-depth analysis of the implementation of a technology- and arts-based nonformal education program realized through smartphone photography classes as a community empowerment effort. This study aimed to examine the effectiveness of photography classes using smartphones in improving technical skills and digital literacy and promoting the social and economic empowerment of learners, particularly women and housewives. Additionally, this study seeks to identify the factors that support and hinder the program's implementation and to develop strategic recommendations for the development of similar models in the context of community education in the digital age. This study used a qualitative approach with a descriptive

case study design. This approach was chosen because it allows researchers to delve deeply into the process of implementing smartphone photography classes in the context of community education and understand the social dynamics and experiences of participants during the learning process. The case study focuses on the Moto Teh Ina Class program, a community-based non-formal online class that teaches basic to advanced techniques of photography using smartphones to the public, especially housewives, adolescents, and adult women. The subjects in this study consisted of participants in the Moto Teh Ina Class program, which is spread across various regions of Indonesia. The subject-taking technique was carried out purposively with the following criteria: (1) having participated in at least one batch of Moto Teh Ina classes, (2) having a smartphone used during learning activities, and (3) willing to provide information and reflections related to their experience of participating in the class. The number of informants consisted of 10 active participants, 2 teacher mentors, and one program manager. Before data collection, the researcher requested consent to become an informant. Participation was voluntary, and the informants were given complete freedom to withdraw at any time without consequences. To maintain confidentiality, the researcher used initials in the data and analysis results and securely stored the information provided by the participants. Data collection was carried out through three main techniques: (1) in-depth interviews, (2) participatory observation of online classroom activities conducted through WhatsApp groups, and (3) documentation in the form of photo archives, training materials, and participants' work. Interviews were conducted online with semi-structured guidance to allow for the exploration of the informants' narratives and subjective experiences. Observations were focused on interactions during the teaching-learning process, material delivery, photo curation process, and communication patterns between the participants and mentors. To maintain the validity and credibility of the data, this study applied the triangulation technique of sources and methods. Triangulation was carried out by comparing the results of interviews, observations, and documentation, as well as by cross-checking key informants. Validity is also strengthened through member checking, which is the reconfirmation of the results of data interpretation with several participants to ensure the accuracy of the constructed narrative. Data analysis was conducted using thematic analysis techniques. The analysis procedure consisted of the following stages: (1) transcription of raw data from interviews and observations; (2) identification of relevant initial codes; (3) grouping the codes into main themes such as the learning process, technical challenges, empowerment impacts, and the use of technology; and (4) contextual integration of meaning to build a comprehensive understanding of the implementation of smartphone photography classes in the context of public education. Overall, this research method is designed to provide a holistic, in-depth, and contextual picture of how the smartphone photography class in the Moto Teh Ina Class can be a model of non-formal education based on technology and art that is effective in improving skills, digital literacy, and the community's social and economic empowerment. Data collection was conducted in an inclusive, supportive, and non-discriminatory environment in accordance with the social research code of ethics.
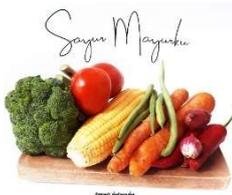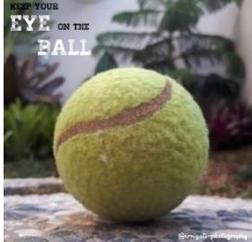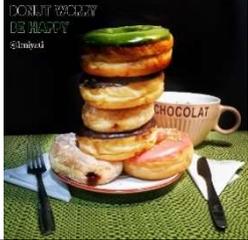
RESULTS AND DISCUSSION
Results
The implementation of the smartphone photography class in the Moto Teh Ina class program showed a significant improvement in participants' technical skills, especially in

terms of visual composition, lighting techniques, and image editing. Most participants had no formal experience in photography before the program. However, after participating in a seven-day training series, most participants were able to produce high-quality photos using only their smartphones. Mastery of editing applications, such as Snapseed, also added value in improving the visual quality of photos. These findings confirm that practical training based on everyday devices is an effective approach to developing visual competence in the community.

Table 1 Techniques and Results of Photography in the Basic Class of Moto Teh Ina Material 1 to 7

Material	Types of Photography Techniques	Understanding Photography Techniques	Result
Material 1	*All about Yellow*	This material was delivered to see the level of ability of participants in terms of photography	
Material 2	*High Key Photography*	This material conveys about capturing colourful vegetables or fruits and how to edit photos in high key photography with the recommended application	
Material 3	*Low Key/dark mood Photography*	This material is taught to use the technique of photographing dark objects and editing with dark backgrounds	
Material 4	*Frog Eye Angle*	This photography technique teaches the angle of taking photos as close as the frog's eyes.	
Material 5	*Flat Lay Photography*	This photography technique teaches techniques for shooting from above	

Integration of Technology and Art through Smartphone Photography Classes for Community Empowerment

Material	Types of Photography Techniques	Understanding Photography Techniques	Result
Material 6	*Eye Level Photography*	This technique teaches shooting with an inline or angel neutral shooting angle	
Material 7	*Macro Texture Photography*	This technique teaches you to shoot at very close distances to get high detail from objects	

One of the notable results of this program's implementation is the improvement in participants' digital literacy, particularly in the use of smartphones and supporting applications. Previously, most participants used smartphones only for basic needs, such as communication and passive information consumption. After participating in the training, they were able to operate photo editing applications, understand the principles of personal branding, and optimize social media to share their work and promote their products. This increase in digital literacy not only opened participants' access to a wider range of information and social networks but also boosted their confidence in expressing themselves through visual media. Based on observations and interviews, it was found that there was a significant psychological impact on the participants' involvement in this program. Participants who previously felt hesitant and lacked confidence in presenting their visual works now feel proud and appreciated after receiving positive feedback from their mentors and fellow participants. Over time, photography has developed into a means of self-expression and identity reinforcement, especially for female participants and housewives, who are the main targets of the program. Providing a safe space for expression and collaboration has created an inclusive, supportive, and empowering learning atmosphere. Another important finding is the emergence of new economic opportunities after participating in the program. Several participants, especially in urban areas, have successfully obtained commercial photography projects, become content creators for Micro, Small and Medium Enterprises, or independently produce visual content for business promotion. One concrete example is a program alumnus who was entrusted with photographing all the photo illustrations for a culinary recipe book published by Media Guru Indonesia. This achievement demonstrates that mastering smartphone-based photography skills can open new jobs and entrepreneurial opportunities. Program evaluations through surveys and interviews showed a high level of satisfaction among participants with the material, delivery methods, and mentor support. Participants assessed that this class provided tangible benefits that could be applied to their lives. However, the implementation of the program was not an obstacle. The main challenges included the limited availability of high-quality smartphones among participants, varying levels of digital literacy, and limited internet signals in certain areas. Several suggestions for improvement were put forward, including requests for follow-up sessions on advanced editing and more specific digital marketing

strategies. Curriculum adjustments according to participant needs demonstrate the importance of an adaptive and contextual learning approach. To address this, the organizers provided technical guidance, video tutorials, and a flexible asynchronous learning approach. In addition, there was initial resistance to the use of familiar communication media. The relevance of this approach also lies in its ability to reach marginalized groups and remote areas through inclusive digital platforms such as WhatsApp. Online classes provide flexibility in terms of time and place, making education accessible to a wider range of people, including housewives with limited mobility.

Discussion

The findings of this study demonstrate that smartphone-based photography classes are effective in enhancing participants technical skills, digital literacy, self-confidence, and creative economic engagement. These results align with previous research that highlights the role of mobile devices in broadening access to flexible, practice-oriented learning opportunities (Ibragimov et al., 2023). The participatory and collaborative methods used in Kelas Moto Teh Ina also confirm the importance of learner-centered approaches in non-formal education, particularly in encouraging creativity and sustaining motivation (Purmayanti, 2022).

One of the key findings was that the participants successfully applied their newly acquired photography skills to entrepreneurial and social activities, such as promoting MSMEs and documenting cultural practices. This reflects the growing recognition of creative industries as drivers of community empowerment, where visual content creation becomes both an economic resource and a medium of cultural expression (Ferrer-Fons et al., 2022). The dual function of art as an expressive form and as an instrument for local economic development illustrates how nonformal education can contribute directly to the Sustainable Development Goals (SDGs), especially those related to decent work, reduced inequalities, and sustainable communities.

Simultaneously, the study reveals that digital literacy gaps and unequal access to devices remain major challenges. This resonates with the existing literature on the digital divide, which stresses that technological empowerment requires not only skill development but also structural support in the form of infrastructure and equitable access (Valizadeh-Haghi et al., 2023). Without addressing these systemic barriers, the scalability and sustainability of smartphone-based educational programs may be limited. The social impact of this program is equally noteworthy. Participants engagement in producing visual narratives of community life illustrates how technology-mediated learning can foster social cohesion and strengthen cultural identity. This finding is consistent with Xu et al. (2022), who argued that photography in community contexts functions as both an educational and identity-building practice. By transforming learners into content creators rather than passive consumers, the program contributes to the democratization of knowledge production and cultural representation.

Taken together, these findings suggest that integrating technology and art into community education has significant transformative potential. However, its effectiveness depends on a cotextualized curriculum design, skilled facilitation, and a supportive digital infrastructure. Future research should expand this analysis through comparative studies with other art- and technology-based nonformal education models to deepen the empirical understanding of their impact across different social and cultural settings.

CONCLUSION

Fundamental Finding: This study confirms that the integration of technology and art through smartphone photography classes significantly improves digital skills, social empowerment, and community economic potential. The Moto Teh Ina classes demonstrate that a practice- and technology-based nonformal education model can effectively bridge gaps in access to education while addressing diverse and contextual learning needs. Participants not only enhanced their technical abilities in composition, lighting, shooting angles, and editing, but also developed greater self-confidence, social participation, and creative expression. Importantly, many participants, particularly women and housewives, were able to transform smartphones from personal devices into productive, income-generating tools. **Implications:** These findings highlight that nonformal education rooted in technology and art is not merely supplementary but can serve as a transformative and sustainable empowerment strategy. By fostering digital literacy, creativity, and economic engagement, smartphone photography classes contribute to building adaptive and independent human resources. They also strengthen the collective community capacity to engage responsibly in digital public spaces, making such initiatives highly relevant to achieving Sustainable Development Goals and shaping future community education policy in Indonesia. **Limitation:** The scope of this study was limited to a single case, which restricted the generalizability of its findings. Reliance on qualitative methods provides rich insights into participants experiences but does not capture broader quantitative impacts or long-term outcomes. Additionally, disparities in digital infrastructure and access remain contextual constraints that may limit the scalability of such programs. **Future research:** Future studies should examine comparative cases of technology and art-based community education across different regions and populations using mixed-method approaches to capture both qualitative and quantitative impacts. Longitudinal studies would be valuable in assessing the sustainability of empowerment outcomes, while investigations into cross-sectoral collaborations with governments, NGOs, and technology providers could inform more inclusive and scalable models. Such studies would expand the evidence base for integrating technology and art into non-formal education as a pathway to community empowerment in the digital era.

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