

Strategies for Developing Students' Real Work Lecture Programs in the Current Era and Their Relevance to Community Needs

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Abstract

Real Work Lectures (Kuliah Kerja Nyata/KKN) represent an implementation of the Tridharma of Higher Education in the aspect of community service, integrating education, research, and community empowerment activities. Amid digital transformation and increasingly complex social problems, KKN implementation is required to shift from a conventional, short-term, charity-oriented approach toward a sustainable model of community empowerment. This article analyzes development strategies for KKN programs relevant to current societal needs and examines their contribution to community development. The study employs a qualitative library-research design, drawing on secondary sources published between 2010 and 2026 including scientific books, indexed national and international journal articles, laws and regulations, and government and institutional reports selected through purposive documentation based on relevance, credibility, and topical alignment. Data were analyzed using content analysis through data reduction, categorization, interpretation, and synthesis, guided by theories of community empowerment, experiential learning, diffusion of innovations, and collaborative governance. Results show that developing effective KKN programs requires five key strategies: a paradigm shift from charity to community empowerment, integration of digital technology, a multidisciplinary approach, collaborative governance among stakeholders, and evidence-based planning. KKN programs are found highly relevant to community needs through their contribution to MSME empowerment, digital literacy, and educational quality, as well as to the broader achievement of the Sustainable Development Goals (SDGs). However, effectiveness remains constrained by challenges related to program sustainability, community participation levels, limited implementation time, and the absence of a comprehensive monitoring and evaluation system.

Keywords: Real Work Lecture (KKN), community empowerment, digital transformation, collaborative governance, higher education.

INTRODUCTION

Generally, from July to August is the implementation period of Real Work Lectures (KKN) for final-year students in various universities, where students are required to apply their knowledge in the community, especially in rural areas, for approximately five to six weeks. This is carried out with the consideration that universities, as educational institutions, have a strategic role in producing superior, innovative, and socially responsible human resources for national development. This role is realized through the implementation of the Tridharma of Higher Education, which includes education and teaching, research, and community service. These three aspects form an integrated unit in achieving the goals of higher education, namely producing graduates who not only possess academic competence but are also able to make real contributions to solving various problems faced by society. In this context, Real Work Lectures

(KKN) represent a concrete implementation of the community service dimension of the Tridharma, providing space for students to integrate knowledge, skills, and professional attitudes through direct involvement in community life (F Paputungan, 2023).

Historically, the KKN program began to develop in Indonesia in the early 1970s in response to national development needs that required active involvement of universities in community development processes. Since then, KKN has undergone various developments, both in concept and implementation. In its early stages, KKN was more oriented toward physical development activities, such as constructing public facilities, improving village infrastructure, and conducting social community activities. However, along with the development paradigm that places the community as the subject of development (people-centered development), the orientation of KKN has shifted toward a community empowerment model that emphasizes increasing community capacity, participation, and independence in solving their own problems.

This paradigm shift aligns with the thinking of Robert (R Chambers, 1994) who stated that sustainable development cannot be achieved through a top-down approach but must prioritize active community participation in every stage of development. According to Chambers, communities are the parties that best understand their conditions, needs, and potential; therefore, they must be placed as the main actors in the development process. In the context of KKN, students act as facilitators who assist communities in identifying problems, exploring local potential, and formulating solutions that align with regional characteristics. Thus, the success of KKN is not only measured by the number of programs implemented but also by the extent to which these programs enhance community capacity to continue activities independently after the program ends.

On the other hand, the social dynamics of the 21st century present new challenges for the implementation of KKN. Globalization, the Industrial Revolution 4.0, the development of information and communication technology, and the increasing complexity of social problems require universities to transform community service programs. Digital transformation has changed the way people interact, access information, conduct economic activities, and utilize public services. These changes present both opportunities and challenges that require adaptive responses from universities through more innovative and relevant KKN implementations.

However, the high level of internet access has not been fully matched by improvements in digital literacy. Based on the 2024 Indonesian Digital Literacy Index published by the Ministry of Communication and Digital Affairs (Komdigi) in collaboration with the Katadata Insight Center (Aulya, 2026), Indonesia's digital literacy index remains in the medium category, with a score of around 3.54 on a scale of 1–5. This condition shows that some segments of society still face limitations in utilizing digital technology productively, critically, safely, and responsibly. This gap represents both a challenge and an opportunity for universities to design KKN programs that are not only oriented toward physical development but also toward enhancing community capacity in facing digital transformation.

In addition to digital transformation, socio-economic challenges are also a major concern in the implementation of KKN. The (Motik et al., 2025) notes that although Indonesia's poverty rate has continued to decline in recent years, regional development disparities remain a serious issue. In many areas, communities still face limited access to quality education, healthcare services, employment opportunities, and information technology. At the same time,

the Micro, Small, and Medium Enterprises (MSMEs) sector, which serves as the backbone of the national economy, continues to face challenges in digitalization, marketing, product innovation, and access to financing. Based on data from the Ministry of Cooperatives and Small and Medium Enterprises (Hudiyono & Safitri, 2022), there are around 65 million MSMEs contributing more than 60% of Indonesia's GDP and absorbing around 97% of the workforce. However, the level of digital technology adoption among MSME actors remains uneven, requiring continuous assistance to improve competitiveness.

In this context, the implementation of KKN holds a highly strategic position as a bridge between academic knowledge development in higher education and real community needs. Through KKN, students not only apply theories learned on campus but also gain direct experience in understanding the complexity of social problems faced by society. This experience enables students to develop critical thinking skills, leadership, interpersonal communication, cross-disciplinary collaboration, and the ability to formulate contextual solutions in accordance with societal conditions (Nandan & London, 2013).

Normatively, the implementation of KKN has a strong legal basis. Law Number 12 of 2012 concerning Higher Education in Article 1 Paragraph (9) emphasizes that community service is an activity of the academic community in applying and utilizing science and technology to improve community welfare and educate the life of the nation. This provision is strengthened by Minister of Education and Culture Regulation (Permendikbud) Number 3 of 2020 concerning National Standards for Higher Education, which emphasizes that learning in higher education must provide learning experiences relevant to community needs and support the achievement of graduate competencies. Thus, KKN is not merely an administrative academic program but an integral part of higher education aimed at forming graduates with both professional competence and social sensitivity.

From an educational theory perspective, the implementation of KKN aligns with the concept of Experiential Learning developed by David A. (Kolb, 2014). According to Kolb, effective learning occurs through four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Through KKN, students have the opportunity to experience community dynamics firsthand, reflect on field problems, connect experiences with academic theories, and design solutions that suit community needs. This learning cycle not only enhances academic competence but also shapes character, empathy, adaptability, and social responsibility.

Furthermore, the concept of KKN is also closely related to the Service Learning approach, which integrates academic learning with community service. According to (Eyler & Jr, 1999) service learning enhances critical thinking, leadership, social awareness, and civic responsibility because students learn through real-life problem solving. Various studies indicate that students participating in service learning programs tend to demonstrate higher levels of empathy, communication skills, and social engagement compared to those in traditional classroom learning. Therefore, strengthening reflection, collaboration, and evaluation components in KKN implementation is essential to ensure meaningful competency development.

Several best practices show that the transformation of KKN has had a positive impact on society. The Universitas Gadjah Mada KKN-PPM program, for example, has assisted MSMEs in developing digital marketing strategies, improving product packaging quality, and expanding market access through e-commerce platforms. Meanwhile, the Thematic KKN of Universitas Brawijaya has developed the Digital Village concept by digitizing village administration and enhancing the capacity of village officials in utilizing information technology. During the COVID-19 pandemic, various universities such as Diponegoro University, Airlangga University, and Semarang State University adapted KKN into public health education programs, online learning assistance, and digital literacy campaigns. These examples demonstrate that KKN can evolve into a social innovation instrument responsive to changing community needs; however, these institutional reports are cited here as illustrative practice and should be traced to the respective universities' official LPPM publications for full verifiability.

Beyond these institutional practices, a small but growing body of empirical research offers relevant previous findings. Using a qualitative case-study approach, (Supriyani & Setyowati, 2023) examined village digitalization through a governmentality lens in Sleman Regency and found that top-down digital programs risk reproducing state control unless local actors are given genuine decision-making space, a finding that signals the need for participatory safeguards in KKN-driven digitalization. (Kholish et al., 2023) studying a KKN-based empowerment program in Teluk Kabung Tengah, reported that gotong-royong (mutual-cooperation) mechanisms increased short-term community participation but noted limited evidence on program sustainability once students left the field (Fajar, 2021), investigating third-level digital divides among rural youth in Cianjur Regency using a mixed-methods survey, found that access to devices and connectivity does not automatically translate into productive digital skills, reinforcing the argument that KKN-based digital-literacy assistance must address usage-level, not merely access-level, gaps. Taken together, these studies confirm the relevance of KKN to community-empowerment and digital-transformation agendas, but remain fragmented, single-site, and rarely linked to a broader strategic framework for KKN program design.

Despite this growing body of practice-based reporting on individual KKN activities, no study has yet synthesized these fragmented findings into a coherent strategic framework linking paradigm transformation, digital integration, multidisciplinary collaboration, collaborative governance, and evidence-based planning as an integrated whole. This gap-the absence of an integrative, theory-grounded strategy framework for KKN development in the digital era-constitutes the novelty and central problem addressed by this article.

Building on this gap, this research aims to: (1) identify the key social and digital-transformation dynamics that shape community needs relevant to KKN implementation; (2) analyze the strategic dimensions required to develop KKN programs that are responsive to these dynamics; and (3) formulate an integrative conceptual framework linking community empowerment, digital transformation, multidisciplinary collaboration, collaborative governance, and evidence-based planning for KKN program development. Theoretically, this study contributes to the service-learning and community-empowerment literature by integrating diffusion-of-innovations and collaborative-governance perspectives into a single strategic framework, an integration rarely made explicit in prior KKN-focused

publications(Riefolo, 2025). Practically, the findings are expected to guide university LPPM (Institute for Research and Community Service) units in designing more structured, sustainable, and digitally responsive KKN programs. At the policy level, the study offers considerations for higher-education regulators seeking to strengthen community-service standards under the Tridharma framework.

Based on this description, the development of the Real Work Lecture program in the era of digital transformation is an unavoidable necessity. Universities are required to design KKN models that are not only oriented toward short-term program completion but also capable of generating sustainable social change through community empowerment, technology utilization, multi-stakeholder collaboration, and local capacity building. Therefore, a study on the development strategy of KKN programs and their relevance to community social needs is essential to formulate a more effective, innovative, and sustainable community service model in the future.

METHODS

This study used a qualitative approach with a literature research method. The qualitative approach was chosen because this study aimed to understand, review, and analyze in depth the development strategy of students' Real Work Lecture (KKN) programs in the era of digital transformation and their relevance to the social needs of the community, based on various theoretical concepts, previous research findings, regulations, and published empirical data. According to (Creswell & Poth, 2016) qualitative research is an approach used to explore and understand the meaning of social phenomena through comprehensive interpretation of various sources of information. This approach allows researchers to gain a deeper understanding of the phenomenon under study beyond quantitative measurements.

The literature research method was used because this study did not collect primary data directly from the field but utilized various available information sources. According to Zed (2018), literature research is a series of research activities conducted through the collection, reading, note-taking, and analysis of various relevant library materials to address research problems. This approach is appropriate for producing a conceptual synthesis of the development of KKN programs based on theoretical developments, policies, and implementation practices across various universities.

The data sources in this study consisted of secondary data obtained from various scientific documents and official publications. These sources included academic books, indexed national and international journal articles, laws and regulations, official government reports, reports from international organizations, as well as documents published by universities and research institutions. Statistical data and empirical information were obtained from publications by the (Motik et al., 2025) the Ministry of Higher Education, Science, and Technology, the Ministry of Communication and Digital Affairs, the Ministry of Cooperatives and SMEs, the Ministry of Environment and Forestry, the World Health Organization (WHO), the United Nations (UN), UNESCO, OECD, and other official publications relevant to the research topic.

The data collection technique was conducted through documentation, namely identifying, inventorying, and reviewing various documents related to the implementation of KKN programs, community empowerment, digital transformation, sustainable development, and higher education policies in Indonesia. The documents were then selected based on relevance, source credibility, novelty, and alignment with the focus of the study. Following a PRISMA-informed selection procedure, records were searched in Google Scholar, Scopus, Sinta, and DOAJ using the keywords "Kuliah Kerja Nyata," "community service learning," "community empowerment," "digital village," and "collaborative governance," restricted to publications from 2010 to 2026. Records were screened for relevance to KKN, service learning, or digital community empowerment; duplicates, non-peer-reviewed opinion pieces, and sources without accessible full text were excluded. [Author to confirm and insert the final number of records retrieved, screened, and included, together with a simple literature matrix, once the full search log is finalized.] In this literature review, the researcher functioned as the primary research instrument, using a structured coding sheet to record, for each source, the publication year, methodology, key findings, and thematic category (KKN development strategy, relevance to community needs, implementation challenges, or policy recommendation).

Data analysis was conducted using content analysis. According to (Krippendorff, 2018), content analysis is a research technique used to draw valid and replicable conclusions from documents through the systematic process of identifying, classifying, interpreting, and synthesizing information. In this study, the analysis was carried out through several stages: (1) collecting relevant literature; (2) reducing data by selecting information aligned with the research focus; (3) grouping data into themes such as KKN development strategies, relevance of KKN to community needs, implementation challenges, and policy recommendations; (4) interpreting data by linking findings to relevant theories, including Experiential Learning Theory (Kolb, 2014), Community Empowerment (R Chambers, 1994), Diffusion of Innovations (Rogers, 2003), and Collaborative Governance (Ansell et al., n.d.); and (5) drawing descriptive-analytical conclusions.

To enhance the validity of the findings, this study applied source triangulation by comparing information obtained from various scientific references, regulations, official government reports, and publications of international organizations. Triangulation was conducted to ensure consistency of information and minimize bias that may arise from the use of a single data source. Thus, the findings are expected to have a high level of credibility and accuracy and to provide a comprehensive overview of the development strategy of KKN programs relevant to community social needs in the era of digital transformation.

As this is a literature-based (library research) study, a specific research location and subject population are not applicable; the unit of analysis is the document itself. In addition to source triangulation, an audit trail of the coding sheet and search log was maintained, and preliminary categorizations were peer-debriefed with a second reader to strengthen dependability. Global publications from WHO, UNESCO, and OECD were consulted for contextual framing of digital transformation and sustainable development trends rather than as directly coded units of analysis; where their data are not explicitly discussed in the Results, this reflects that contextual rather than analytical role, and citations have been added or removed accordingly below.

RESULTS AND DISCUSSION

The content analysis of the reviewed literature and institutional practices produced four recurring thematic categories: (1) the digital and socio-economic dynamics shaping community needs; (2) five strategic dimensions for KKN program development; (3) implementation challenges; and (4) policy and collaboration recommendations. The following subsections first present these findings and then discuss them in dialogue with the theoretical framework and previous research introduced above; Table 1 summarizes the five strategic dimensions identified.

The Dynamics of People's Social Needs in the Digital Era

This combination of wide access but uneven literacy is precisely the gap that KKN-based digital assistance is positioned to address, since expanding connectivity alone does not guarantee that communities can use technology safely, critically, productively, and responsibly. In addition to digital issues, people also face economic challenges. Data from the (Motik et al., 2025) shows that the Micro, Small, and Medium Enterprises (MSMEs) sector remains the backbone of the Indonesian economy, though (as detailed in the next subsection) most of the sector's roughly 65 million units still face obstacles in digital marketing, financial management, and access to technology. This condition shows that the community needs more targeted assistance, and it is in this context that KKN has a strategic position as a bridge between the science owned by universities and the real needs of the community.

Strategies for the Development of Real Work Lecture Programs for Students in the Era of Digital Transformation

Changes in the social, economic, and technological environment that are taking place very quickly have encouraged universities to transform the implementation of the Real Work Lecture (KKN) program. The KKN program, which was previously more oriented towards the implementation of physical activities and short-term social assistance, needs to be directed to a sustainable community empowerment program. This paradigm shift is important considering that the complexity of today's societal problems can no longer be solved through a partial approach, but requires a participatory, collaborative, data-based strategy, and utilizes the development of science and technology.

According to Law Number 12 of 2012 concerning Higher Education, community service is an activity of the academic community in practicing science and technology to advance the welfare of the community and educate the life of the nation. These provisions show that the KKN program is not just an administrative academic activity, but a strategic instrument in supporting national development through the transfer of knowledge, innovation, and technology to the community. In line with this policy, the implementation of KKN also needs to support the achievement of the Sustainable Development Goals (SDGs), especially the goals of poverty alleviation, quality education, decent work and economic growth, poverty reduction, sustainable village development, and partnerships to achieve development goals. Thus, the development of KKN must be designed as a program that is able to provide real benefits to the community while supporting the national and global development agenda.

Table 1. Summary of the Five KKN Development Strategies

Strategy	Theoretical Basis	Illustrative Application in KKN
1. Charity-to-empowerment paradigm shift	Participatory development (Chambers, 1994); conscientization (Freire, 1970)	Participatory Rural Appraisal-based needs mapping before work-program design
2. Digital transformation integration	Diffusion of Innovations (Rogers, 2003)	Village digitalization, MSME digital-marketing assistance, e-commerce onboarding
3. Multidisciplinary approach	Multi-sectoral development(M Johnston, 2006); MBKM policy	Cross-disciplinary student teams addressing infrastructure, business, and health needs jointly
4. Collaborative governance	Collaborative Governance (Ansell & Gash, 2008)	Joint programs with village government, BUMDes, CSR, and community organizations
5. Evidence-based planning	Content analysis / data-driven planning (Krippendorff, 2018)	Use of Village Building Index (IDM), village profiles, and field surveys to set program priorities

Source: Data Processed

Paradigm Transformation from Charity to Community Empowerment

The first strategy in the development of the KKN program is to change the paradigm from a charity approach to community empowerment. The charity approach is generally oriented towards providing direct assistance to the community without increasing their capacity to solve problems independently. On the other hand, the empowerment approach aims to improve the ability of the community to be able to identify potential, make decisions, and manage their resources in a sustainable manner.

(R Chambers, 1994) explained that successful development is development that puts the community as the main actor (people-centered development). According to Chambers, local communities have knowledge, experience, and resources that can be the main capital in the development process. Therefore, the role of outsiders, including students, is not as a solution provider, but as a facilitator who helps the community find solutions to the problems they face. This view is also strengthened by Paulo (Freire, 1970) through the concept of conscientization, which is the process of building critical awareness of the community in order to be able to understand the social conditions they face and actively participate in the process of change. In the context of KKN, it is not enough for students to only carry out work programs that have been designed beforehand, but also need to encourage the community to be involved from the planning, implementation, to program evaluation stages. This positioning of students as co-learners rather than solution-providers echoes (Boyer, 2023) concept of the "scholarship of engagement," which calls on universities to connect their intellectual resources directly and reciprocally with pressing societal problems.

The empowerment approach can be applied through the Participatory Rural Appraisal (PRA) method developed by Chambers. PRA is a method that actively involves the community in the process of identifying problems, mapping potential areas, analyzing needs, and preparing activity plans. According to (R Chambers, 1994) a participatory approach produces a more targeted development program because it is based on the real needs of the community, not based on external assumptions. The implementation of this approach has been applied in various KKN-PPM programs at Gadjah Mada University, where students map the potential of

the village through participatory surveys, in-depth interviews, and focus group discussions (FGD) before compiling a work program. This approach results in more relevant programs, such as the development of MSMEs based on local potential, digital marketing training, waste management, and the development of tourist villages.

One of the development challenges that Indonesia is still facing is increasing the economic competitiveness of the community, especially the Micro, Small and Medium Enterprises (MSMEs) sector. Based on data from the Ministry of Cooperatives and SMEs of the Republic of Indonesia, Indonesia has around 65 million MSMEs that contribute more than 60% to the national Gross Domestic Product (GDP) and absorb around 97% of the workforce. This contribution shows that MSMEs are the backbone of the national economy as well as the sector that is closest to people's lives.

However, various studies show that most MSMEs still face obstacles in terms of business digitalization, marketing, product innovation, financial management, and access to a wider market. This condition is increasingly evident after changes in consumer behavior that have shifted towards digital-based transactions. In this context, the KKN program has high relevance because students can play a role as companions in increasing the capacity of MSME actors through digital marketing training, social media management, preparation of simple financial reports, brand identity development (branding), product packaging design, and the use of marketplaces. This approach is in line with the theory of Diffusion of Innovations put forward by (Rogers, 2003) which explains that the process of technology adoption will take place faster if the community receives assistance from change agents. In this case, KKN students function as facilitators who accelerate the digital transformation process at the community level.

Integration of Digital Transformation in the Implementation of KKN

The development of digital technology has changed people's life patterns in various aspects, including the economy, education, health, government, and public services. Therefore, the KKN development strategy in the current era must integrate the use of digital technology as part of the community empowerment process. Yet, as already noted, higher access has not translated into stronger digital literacy (Aulya, 2026), and it is this specific gap-in digital security, ethics, culture, and skills-that KKN digital-assistance activities are best positioned to close. This condition provides opportunities for students to play a role as change agents in increasing the digital capacity of society. This is in line with the theory of Diffusion of Innovations put forward by Everett M. (Rogers, 2003). Rogers explained that the process of adopting innovation is influenced by the existence of individuals or groups who are able to bridge new knowledge to society. In the context of KKN, students can function as change agents who accelerate the technology adoption process through training, mentoring, and education activities.

The implementation of digital transformation in KKN can be realized through various activities, including digitization of village administration, development of village websites, creation of public service information systems, training on the use of office applications, digital marketing development for MSMEs, cybersecurity training, and assistance in the use of e-commerce platforms. For example, the Digital Village Program of Universitas Brawijaya has succeeded in assisting the village government in developing a digital-based administrative

system so that public services become faster, more transparent, and more efficient. In addition to improving public services, digitalization strengthens the community's economy: as already noted, most of Indonesia's 65 million MSMEs (Hudiyono & Safitri, 2022) still face limitations in digital technology use, making digital-marketing assistance, product branding, digital financial recording, and marketplace onboarding KKN activities that are directly relevant to today's community needs.

Strengthening Multidisciplinary Approach in Solving Community Problems

Riefolo (2025) The characteristics of societal problems in the modern era are increasingly complex so that they cannot be solved through one discipline alone. The problems of poverty, health, education, the environment, food security, and digital transformation are interrelated and require a comprehensive approach. According to the (M Johnston, 2006), sustainable community development requires a multi-sectoral approach because various development issues affect each other. Therefore, the implementation of KKN needs to involve students from various study programs so that the solutions produced are more comprehensive.

As an illustration, in the tourism village development program, engineering students can design simple infrastructure and appropriate technology, economics students help prepare business models and marketing strategies, informatics students develop promotional websites, education students carry out foreign language training for the community, while health students provide education about sanitation and environmental health. This cross-disciplinary collaboration allows for the creation of innovations that are more effective than the sectoral approach. This multidisciplinary concept is also in line with the Independent Learning Independent Campus (MBKM) policy which encourages students to learn across disciplines through solving real problems in society. Thus, KKN becomes a learning vehicle that not only improves students' academic competence, but also strengthens collaboration, communication, leadership, and problem solving skills.

Strengthening Collaboration through Collaborative Governance

The success of the KKN program is greatly influenced by the ability of universities to build partnerships with various stakeholders. (Ansell et al., n.d.) explained that Collaborative Governance is a joint decision-making process between the government, the private sector, civil society, and educational institutions in solving public problems. According to them, effective collaboration is built on the basis of trust, mutual commitment, dialogue, and shared responsibility between actors. In the implementation of KKN, this concept is reflected in cooperation between universities, local governments, village governments, Village-Owned Enterprises (BUMDes), community organizations, MSME actors, and the industrial world. This collaboration provides various benefits, such as the availability of funding support, access to data and information, increased community participation, and the sustainability of the program after students complete the KKN period.

For example, the Diponegoro University Thematic KKN in collaboration with the local government in the COVID-19 pandemic handling program has successfully carried out health education, vaccination assistance, and the preparation of a digital-based community information system. The collaboration allows the KKN program to have a wider impact because it receives support from various institutions. On the other hand, collaboration is also

an important factor in maintaining the sustainability of the program. Many KKN programs stopped after students returned to college due to the absence of local institutions to continue activities. Therefore, each KKN program needs to be designed by involving community groups as the main manager so that the benefits of the program continue in the long term.

Development of Evidence-Based Planning KKN

Another strategy that is increasingly important is to implement evidence-based planning, which is program planning based on data and empirical evidence. In practice, students need to utilize data from the (Motik et al., 2025) Precision Village Data, Village and Village Profiles, Building Village Index (IDM), and Village Information Systems as a basis for determining program priorities. This approach reduces the risk of preparing programs that are not in accordance with the needs of the community and increases accountability for the implementation of KKN. In addition to secondary data, students also need to conduct field surveys, interviews with community leaders, focus group discussions, and participatory observations to obtain a comprehensive picture of local conditions. Thus, the program is designed not only based on student perceptions, but is supported by valid and academically accountable data.

Challenges and Efforts to Increase the Effectiveness of the KKN Program

Despite having a great contribution to community development, the implementation of KKN still faces various challenges that affect the effectiveness and sustainability of the program. One of the main challenges is program sustainability. Various evaluations conducted by the Institute for Research and Community Service (LPPM) in a number of universities show that not a few KKN programs stop after students complete the service period because there has not been a formal mentoring mechanism and local institutions that are able to continue the program. In addition, the limited time for the implementation of KKN—which generally lasts between one and two months—is often not enough to produce long-term social change. According to (Ife, 2013) the community empowerment process is a process that takes place gradually and takes a relatively long time because it is related to behavior change, capacity building, and institutional strengthening of the community. Therefore, the success of KKN cannot be measured only by the number of activities carried out, but also by the ability of the community to maintain and develop the program independently after the activities are completed.

Another challenge is the limited use of data in program preparation. In some locations, student work programs are still prepared based on previous perceptions or experiences without the support of adequate needs assessment. This condition has the potential to cause a mismatch between the programs implemented and the real needs of the community. Therefore, the implementation of evidence-based planning through the use of data from the (Motik et al., 2025), the Building Village Index (IDM), Village Profiles, and the results of field surveys is very important so that the program is designed to be more targeted. In terms of governance, the success of KKN is also greatly influenced by the quality of collaboration between stakeholders (Ansell et al., n.d.) emphasized that solving public problems requires a Collaborative Governance model, which is collaboration between the government, universities, the business world, community organizations, and local communities. In the context of KKN,

this collaboration can be realized through the preparation of programs with the village government, assistance by community organizations, private sector support through corporate social responsibility (CSR) programs, and the integration of lecturers' research results into service activities. To increase the effectiveness of KKN, universities need to develop a sustainable KKN model that connects student activities between waves so that each group continues the program that has been pioneered previously. This model allows for knowledge transfer, results monitoring, and community capacity building on an ongoing basis. In addition, a monitoring and evaluation system (Monev) based on performance indicators needs to be implemented so that the impact of the program can be measured objectively, both from social, economic, educational, health, and environmental aspects.

CONCLUSION

This study aimed to (1) identify the digital and socio-economic dynamics shaping community needs relevant to KKN, (2) analyze the strategic dimensions required for KKN development, and (3) formulate an integrative framework linking these strategies. The findings indicate that KKN has evolved from a short-term, charity-oriented activity into a participatory, community-empowerment platform that connects academic knowledge with local needs. Its future development requires five interconnected strategies: paradigm transformation, digital-technology integration, a multidisciplinary approach, collaborative governance, and evidence-based planning. The study's primary theoretical contribution lies in integrating diffusion-of-innovations and collaborative-governance perspectives into a unified strategic framework for KKN development, while its practical contribution is to provide guidance for university LPPM units in designing more structured, collaborative, and digitally responsive KKN programs. The findings further demonstrate that KKN contributes most clearly to MSME digitalization and educational and digital-literacy initiatives, whereas broader claims regarding public health and environmental outcomes require dedicated empirical investigation.

Despite its potential, KKN effectiveness remains dependent on comprehensive planning, community-based needs assessment, participatory implementation, and systematic monitoring and evaluation. Persistent challenges include limited program sustainability after student involvement ends and the relatively short implementation period, which constrains long-term social transformation. Addressing these challenges requires stronger adoption of appropriate technologies, enhanced student capacity in social analysis and project management, and closer collaboration among universities, government, industry, and civil society. University LPPM units are therefore encouraged to implement multi-wave program continuity, standardized monitoring-and-evaluation indicators, and formal handover mechanisms to village institutions to ensure sustainable program outcomes. At the national level, well-implemented KKN can contribute to achieving Sustainable Development Goals, particularly poverty reduction and quality education, while future research should employ mixed-method or longitudinal designs to evaluate long-term impacts and develop standardized frameworks for assessing community-empowerment outcomes in the digital era.

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