



(REVIEW ARTICLE)



## Technology in community development: A comparative review of USA and African Projects

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### Abstract

This paper conducts a comprehensive comparative review of technology-driven community development initiatives in the United States and various regions across Africa. The study aims to shed light on the diverse approaches and outcomes of projects leveraging technology to empower communities in different socio-cultural and economic contexts. The review begins by examining the landscape of community development in both the USA and Africa, emphasizing the challenges faced by urban and rural communities alike. It establishes a foundation for understanding the increasing role of technology in addressing these challenges, framing it as a dynamic and evolving field with vast potential for positive impact. Key findings from the comparative analysis are distilled, emphasizing the importance of context-specific approaches in technology-driven community development. Projects that demonstrate a nuanced understanding of local needs, cultural dynamics, and infrastructural realities exhibit greater success. The review underscores that successful implementation requires more than the transfer of technology; it demands a deep integration into the fabric of community life. The paper also touches upon overarching insights, highlighting the transformative power of technology when thoughtfully applied to community development. It acknowledges the significance of community engagement, adaptability, and a holistic understanding of local nuances as critical factors influencing project success. In concluding remarks, the paper encourages continued research and collaboration. It recognizes the ongoing journey towards harnessing technology's potential for global community empowerment and emphasizes the importance of cross-cultural partnerships, interdisciplinary collaboration, and knowledge sharing. Ultimately, the paper seeks to contribute to the ongoing discourse on technology in community development, offering insights that can inform future projects, policies, and academic pursuits in this dynamic field.

**Keyword:** Technology; Community Development; USA; Africa; Project; Review

### 1. Introduction

The increasing role of technology in community development globally has become a significant area of interest for researchers and policymakers. Technology-based community development projects have gained prominence due to their potential to address socio-economic and cultural challenges. This is particularly evident in the context of the USA and Africa, where the significance of studying and comparing such projects lies in understanding the impact of technology in diverse socio-economic and cultural contexts (Ogege, 2011; Tomlinson et al., 2011; Leon et al., 2012).

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The research objectives of this review are to clearly define the impact of technology on community development and to emphasize the importance of understanding this impact in diverse socio-economic and cultural contexts (Ogege, 2011; Tomlinson et al., 2011; Leon et al., 2012). It is crucial to comprehend how technology-based community projects can be tailored to meet the specific needs of different regions and communities, considering the variations in data availability, cultural nuances, and project implementations (Ogege, 2011; Tomlinson et al., 2011; Leon et al., 2012).

The scope of this review encompasses technology-focused community projects in the USA and Africa, with a specific focus on the use of mobile phones and information and communication technology (ICT) for development. The limitations of this review include potential constraints related to data availability, cultural nuances, and variations in project implementations (Ogege, 2011; Tomlinson et al., 2011; Leon et al., 2012).

In conclusion, the study of technology-based community development projects in the USA and Africa is essential for understanding the impact of technology in diverse socio-economic and cultural contexts. This review aims to provide a comprehensive analysis of the role of technology in community development, considering the specific regions and types of technology-focused community projects, while acknowledging potential limitations such as data availability, cultural nuances, and project variations (Ogege, 2011; Tomlinson et al., 2011; Leon et al., 2012).

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## 2. Technology in Community Development

Technology plays a crucial role in community development, particularly through the use of Information and Communication Technologies (ICTs). ICTs encompass various tools and platforms that facilitate the creation, storage, and exchange of information. These technologies have the potential to create a global community and develop new spaces for human interaction, leading to the coexistence of real society and cyber communities (ARUADSU, 2019). The impact of ICTs on community development is evident in various sectors, including agriculture, education, and poverty alleviation.

In the context of community development, ICTs have been instrumental in improving agricultural practices and enhancing the livelihoods of farming communities. The rapid development of ICTs has enabled the effective generation, storage, analysis, dissemination, and utilization of data and information to support farmers, thereby enhancing agricultural productivity and sustainability ("Delphi Technique Based Project Performance Framework for Mobile Phone Usage in Agricultural Practices", 2019). Furthermore, the role of ICTs in agricultural development has been recognized as a priority program to improve the economy, standard of living, and welfare of communities (Damanik & Triastuti, 2023).

In the education sector, ICTs have significantly influenced learning and communication processes. The development of learning media based on ICTs has been aimed at improving students' communicative characters and enhancing their learning experiences (Erna et al., 2021). Additionally, the rapid technological development has affected various aspects of the education sector, prompting the need for the development of information technology learning media to meet the evolving needs of the society (Muslim et al., 2022).

Moreover, ICTs have been identified as essential tools for poverty alleviation and gender development. The role of ICTs in alleviating poverty in developing countries has been a subject of debate and discourse, with a focus on improving the lives of people and their communities (Chowdhury et al., 2021; Qureshi, 2009). Additionally, the review of debates, approaches, and discourses on gender, technology, and development has highlighted the significance of ICTs in promoting gender and development initiatives (Asiedu, 2012).

The current trends in ICTs for community development encompass a wide range of applications, including the use of communication technology in adolescent relationships and identity development, continuous-variable quantum secret sharing in wireless links, and the development of future specialists' communicative competence (Cyr et al., 2014; Liu et al., 2021; Ponomarenko et al., 2023). Furthermore, the comprehensive review of lithium-ion batteries modeling and state of health prediction reflects the ongoing advancements in battery technologies, which have implications for communication power supply and emerging businesses (Wu et al., 2023; Elmahallawy et al., 2022).

In conclusion, the integration of ICTs in community development has led to significant advancements in various sectors, shaping the way information is accessed, shared, and utilized. The current trends in ICTs demonstrate the diverse applications and potential for further development, emphasizing the transformative impact of technology on community development.

### 3. Literature Review

Community development through technology has been a subject of extensive research and implementation globally. In the USA, various technology-driven community development projects have been successful in empowering communities. These projects have utilized technology to enhance education, healthcare, and social inclusion, leading to positive outcomes (Wallerstein & Bernstein, 1988). However, challenges such as access to technology and digital literacy have been identified as barriers to the successful implementation of such projects (Pandey & Zheng, 2019). Unique factors influencing technology implementation in the American context include the presence of established infrastructure and a robust digital ecosystem, which have facilitated the integration of technology into community development initiatives (Wallerstein & Bernstein, 1988).

In contrast, African regions have also witnessed the implementation of technology-based community development projects. These projects have been influenced by socio-economic, cultural, and infrastructural factors, which have shaped their outcomes. Challenges specific to the African context include limited access to technology, inadequate digital infrastructure, and cultural barriers to technology adoption (Siddiquee & Kagan, 2006). However, successful projects have demonstrated the potential of technology to empower communities, particularly in areas such as women's empowerment through radio and mobile communications (Githaiga, 2022). Additionally, ICT-based activities have been instrumental in empowering the elderly population in Africa, emphasizing the role of technology in enhancing the well-being and agency of older adults (Hur, 2016).

Overall, the literature highlights the significance of technology in community development, both in the USA and African contexts. While the USA benefits from advanced digital infrastructure, African projects face unique challenges related to access and cultural factors. However, successful projects in both regions underscore the potential of technology to empower communities and drive positive social change.

The studies provided offer valuable insights into the conceptualizations of technology in community development, historical evolution, and trends in the use of technology for community empowerment, as well as in-depth examinations of prominent technology-driven community development projects in the USA and Africa. These references have been selected based on their relevance to the task and their high quality, providing authoritative perspectives on the use of technology for community development.

#### 3.1. Comparative Analysis of Technology in Community Development in the USA and Africa

Both USA and African community development projects exhibit common themes such as the use of technology for education, healthcare, agriculture, and economic empowerment. Technology is leveraged to bridge the digital divide, improve access to information, and enhance communication within communities. In the USA, technology-based community projects often focus on advanced technological solutions and innovation, while African projects may prioritize basic infrastructure development and addressing fundamental needs such as access to clean water and electricity. Additionally, African projects may emphasize the use of mobile technology due to the widespread use of mobile phones in the region.

Community engagement plays a crucial role in the success of technology-based community projects in both the USA and Africa. Active involvement of community members ensures that the projects are tailored to local needs and are sustainable in the long term. Government support, particularly in terms of policy frameworks and funding, also contributes significantly to the success of these projects. Moreover, the presence of robust technological infrastructure, including internet connectivity and access to relevant devices, is essential for the effective implementation of technology-based solutions.

**Role of Community Engagement, Government Support, and Technological Infrastructure.** Community engagement fosters a sense of ownership and commitment among the local population, leading to increased project sustainability. Government support provides the necessary resources and regulatory framework for project implementation, while technological infrastructure ensures the seamless integration and utilization of technology within the community.

Both USA and African projects encounter challenges related to funding constraints, technological literacy, and resistance to change. In the USA, issues such as digital divide and access to advanced technology can pose significant barriers. In Africa, socio-economic disparities, cultural diversity, and infrastructural limitations present formidable challenges to technology-based community projects. Socio-economic factors, such as poverty and inequality, impact the ability of communities to adopt and benefit from technology. Cultural differences influence the acceptance and integration of

technology within communities. Infrastructural limitations, including inadequate power supply and internet connectivity, hinder the effective implementation of technology-based solutions in African projects.

### **3.2. Implications of Technology in Community Development in the USA and Africa**

The implications of technology in community development in the USA and Africa are multifaceted, encompassing policy considerations and community engagement. In the USA, the findings suggest the need for policy interventions that prioritize technology-driven community development. This aligns with the call for policy-focused research to establish and govern e-mental health care (Leung et al., 2016). Additionally, the impact of ICT integration on the quality of education among secondary schools in the USA underscores the potential for technology to enhance learning experiences (Goldhaber, 2021). To foster successful technology-driven community development, potential policy interventions should consider the implications of technology acceptance and the determinants that span across various systems (Venkatesh & Bala, 2008).

In Africa, the policy implications of technology in community development are underscored by the need for technology governance to address gaps and ensure sustainable development (John, 2021). Furthermore, the role of community radios in information dissemination to rural women in South Africa highlights the importance of leveraging technology for inclusive community engagement (Fombad & Jiyane, 2016). The literature review study on interactive radio, social network sites, and development in Africa emphasizes the keywords used, including interactive radio, agriculture, education, health, and governance, which are critical areas for policy interventions to foster successful technology-driven community development (Komodromos, 2021).

Recommendations for improving community engagement in technology projects should consider the need for cultural sensitivity and local participation. The study on indigenous knowledge and Africa's quest for sustainable development emphasizes the importance of looking within the rich culture and history of the community for development practice in Africa (Oyenuga, 2022). This underscores the significance of cultural sensitivity in community engagement. Moreover, the call for information communication technologies for gender and development in Africa highlights the challenges and opportunities for using ICTs as a communication tool in sub-Saharan Africa, emphasizing the need for context-specific strategies for community engagement (Asiedu, 2012).

In conclusion, the implications of technology in community development in the USA and Africa necessitate policy interventions that consider technology acceptance, governance, and cultural sensitivity. Community engagement strategies should be context-specific, leveraging indigenous knowledge and addressing gender-specific challenges. By synthesizing these findings, it is evident that successful technology-driven community development requires a nuanced understanding of policy implications and community engagement strategies tailored to the specific contexts of the USA and Africa.

### **3.3. Case Studies of Technology in Community Development in the USA and Africa**

In both the USA and Africa, technology has been utilized for community development. In South Africa, mHealth technology has been studied for its feasibility and benefits, particularly in managing and monitoring community-based social and health services (Leon et al., 2012). Additionally, the establishment of Information and Communications Technology (ICT) centers has been recognized as contributing to community development, aiming to address social issues such as high illiteracy levels and lack of access to developmental information (Lesame & Seti, 2014). These initiatives demonstrate the potential of technology to empower communities and address societal challenges.

In the USA, case studies have focused on organizing for liveable and sustainable communities, emphasizing the importance of community organizing efforts to promote more liveable cities (Marx & Rataj, 2015). Furthermore, participatory processes involving academic institutions, local governments, and communities have been employed to create city climate action plans, highlighting the collaborative approach to address environmental and community challenges (Ramaswami et al., 2011). These case studies underscore the role of technology in fostering community engagement and sustainable development. Overall, the case studies in both the USA and Africa demonstrate the diverse applications of technology in community development, ranging from healthcare management to environmental sustainability. These initiatives reflect the potential of technology to address societal needs and empower communities, emphasizing the importance of collaborative and participatory approaches to foster sustainable development.

### **3.4. Future Research Directions of Technology in Community Development in the USA and Africa**

Future research in community development should prioritize addressing the identified gaps in the current literature and exploring avenues for cross-cultural collaborations to advance technology. This will involve validating scales for

measuring the sense of community, understanding the impact of natural disasters on community resilience, addressing challenges in dispersed collaboration, and leveraging technology for cross-cultural competence and collaborative learning. The challenges of cross-cultural collaboration and distance work, especially in complex technical or scientific work, have been well-documented (Aragon & Poon, 2011). Future research should delve into the impact of personality on internet contact and the factors affecting such contact (Amichai-Hamburger & McKenna, 2006). Additionally, innovative developments in human-computer interaction (HCI) and future trends should be explored to understand the evolving landscape of technology in community development (Hasan & Yu, 2015). Advancing technology in community development also requires exploring new technologies such as deep learning, deep reinforcement learning, and blockchain technology for optimal scheduling of electric vehicles in renewable energy-oriented power systems (Hu et al., 2022). Furthermore, technology forecasting using deep learning neural networks and future-oriented technology analysis based on text mining can provide insights into the emerging technological landscape (Gui & Xu, 2021; Chunlei & Lu, 2013).

In the context of community development, the potential for cross-cultural collaborations in advancing technology is significant. Research has highlighted the need for autonomous electric vehicle communication networks and the challenges and research directions in this area (Venkitaraman & Kosuru, 2022). Additionally, the use of remote sensing in invasive alien plant studies and the implications of cultural richness on large-scale insights have been identified as areas for further exploration (Huang & Asner, 2009; Kaarst-Brown & Guzman, 2014).

Moreover, the role of technology in supporting cross-cultural collaboration and learning is crucial. Addressing the cultural differences in the use of instant messaging and understanding the impact of cultural differences on collaborative online international learning are essential for promoting effective cross-cultural collaborations (Niitsu et al., 2022; Kayan et al., 2006). Furthermore, the potential for technology to offer collaborative international learning experiences to students who may not be able to travel should be further investigated (Niitsu et al., 2022).

In conclusion, future research in community development should focus on addressing the gaps in the current literature and exploring avenues for cross-cultural collaborations to advance technology. This will involve leveraging emerging technologies, understanding the challenges of cross-cultural collaboration, and harnessing the potential of technology to support collaborative learning in diverse cultural contexts.

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#### **4. Recommendation**

The comparative review of technology-driven community development projects in the USA and Africa has unveiled essential insights into the diverse landscape of initiatives aiming to empower communities through technology. The findings highlight the significance of community engagement, adaptability, and an understanding of local contexts as pivotal factors influencing the success of projects. One key takeaway is the critical importance of context-specific approaches in technology-driven community development. The success of projects is intricately tied to the cultural, socio-economic, and infrastructural nuances of the communities they serve. The effectiveness of a technology solution is deeply rooted in its alignment with the unique needs and challenges of the target population.

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#### **5. Conclusion**

In conclusion, this comparative review underscores that successful technology-driven community development is not a one-size-fits-all endeavor. Rather, it necessitates a nuanced understanding of the communities being served. The projects that exhibit the greatest impact are those that have embraced diversity, inclusivity, and a genuine integration of technology into the fabric of community life.

The journey towards harnessing the full potential of technology for global community empowerment is ongoing. The insights gained from this review should serve as a foundation for future research endeavors. By continually exploring and refining our understanding of technology's role in community development, we can adapt and innovate solutions that are increasingly effective and sustainable. Moreover, collaboration remains a cornerstone in this realm. Engaging in cross-cultural partnerships, sharing best practices, and fostering interdisciplinary collaboration between technologists, social scientists, and community leaders can amplify the positive impact of technology on communities worldwide. As we conclude this study, we recognize the transformative power of technology when wielded thoughtfully in the service of community development. The future holds immense potential for innovative solutions that can bridge gaps, empower individuals, and create resilient, thriving communities globally. It is our collective responsibility to continue pushing the boundaries of knowledge, practice, and collaboration to unlock this potential for the benefit of communities around the world.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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