Information and Communication Technologies in the Application of Ethnography: A Systematic Review of the Literature

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Abstract– This article explores the application of the ethnographic method in contexts mediated by Information and Communication Technologies (ICT). It analyzes how ICT have transformed ethnography, enhancing data collection and analysis through digital tools and facilitating access to geographically dispersed populations. The ability of ICT to capture data in varied formats such as text, audio, and video is highlighted, significantly broadening the spectrum of information accessible to researchers. However, the challenges introduced by these technologies are also discussed, including ethical issues related to privacy and confidentiality, and the potential alteration of the natural dynamics of the studied environments. The use of ICT in ethnography allows for greater immersion in study contexts without the need for constant physical presence, which can be advantageous in situations where the researcher's presence would alter the natural behavior of participants. However, this modality can also compromise the depth of contextual understanding that characterizes traditional ethnography. Additionally, the article addresses how ICT can democratize access to research, allowing the study of communities that would otherwise be inaccessible, although limitations such as inequality in access to these technologies are also noted, which can replicate and exacerbate pre-existing inequalities. The review concludes that, while ICT offer valuable tools that transform ethnographic practice, a critical and reflective approach to their implementation is essential to ensure that ethical principles are respected and the quality of ethnographic research is maintained.

Keywords— Ethnography; Information and Communication Technologies (ICT); Qualitative Data Collection Methods; Qualitative Data Analysis; Ethical Challenges of Ethnography.

I. INTRODUCTION

The integration of Information and Communication Technologies (ICT) across various fields of study has revolutionized traditional methodologies, offering new dimensions and challenges. In the field of ethnography, the use of ICT has not only transformed data collection and analysis techniques but has also redefined the scope and limitations of this investigative approach. This article seeks to thoroughly explore the uses, benefits, drawbacks, and limitations of ICT in the application of ethnography, providing a comprehensive view of their impact on social research.

First, it is crucial to recognize how ICT has enabled innovative ways to record and analyze ethnographic data. The ability of digital technologies to capture large volumes of information in various formats (text, audio, video) has allowed researchers to access a broader spectrum of data [1]. However, this enrichment of data collection also introduces significant challenges in terms of analysis and information management, requiring new skills and analytical tools that may not be accessible to all researchers [2].

Furthermore, ICT facilitates greater immersion in the studied contexts without the continuous physical presence of the researcher, through the use of tools such as remote video cameras, audio recordings, and online communication platforms. This can be particularly useful in contexts where the constant presence of the researcher is not feasible or could alter the natural behavior of the subjects of study [3,4]. However, this form of remote observation can also limit the depth of contextual and personal understanding that is fundamental to traditional ethnography [2].

The third aspect to consider is the potential of ICT to reach populations that would otherwise be inaccessible. Social networks and online forums offer unprecedented opportunities to study communities and cultures that are predominantly digital or geographically dispersed [5]. Although this expands the scope of ethnographic research, it also raises questions about the authenticity and representativeness of the data collected in these digital media.

Another critical point is the impact of ICT on the relationship between the researcher and the participants. Technologies can act as a catalyst for building relationships through more frequent and accessible interactions, but they can also create barriers of impersonality and lack of trust [6]. Technological mediation alters the traditional power dynamics in ethnographic research, which can affect how consent and participation of the subjects are negotiated [6,7].

From an ethical perspective, the use of ICT in ethnography introduces additional complexities. Privacy and confidentiality become even more critical and challenging to manage when digital data are easily replicable and potentially accessible to a wider audience. Researchers must be meticulous in implementing measures to protect the identity and integrity of participants, which can be more challenging in the digital environment [8].

In terms of analysis, ICT offers powerful tools for processing qualitative data, such as text analysis software and collaborative coding platforms [9,10]. These tools can significantly enhance the efficiency and depth of ethnographic analysis. However, reliance on these technologies can also divert attention from the qualitative and reflective interpretation that is essential for ethnography.

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1

On the other hand, technical limitations and unequal access to ICT can reproduce and exacerbate existing inequalities in research. Researchers in resource-limited regions may face significant barriers that affect the quality and scope of their ethnographic studies, thus perpetuating imbalances in global knowledge production [11].

Finally, the future of ethnography with ICT appears promising but is also filled with critical questions. The continual evolution of technologies and their applications in research require constant scrutiny over how these tools shape ethnographic practice [12]. Researchers must be proactive in assessing how ICT can best serve the principles of rigor, ethics, and equity in ethnographic research.

This article, therefore, not only advocates for a reflective integration of ICT into ethnography but also seeks to stimulate ongoing dialogue on how these tools are redefining traditional methods and ethical approaches in social research.

II. METHODOLOGY

To meet the established objectives, a thorough investigation was conducted following the PRISMA protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Additionally, a systematic review checklist from the Joanna Briggs Institute was utilized to ensure the study's quality, transparency, and reproducibility. Despite extensive searches across several specialized databases, no systematic reviews on the topic were identified. The search strategy employed databases such as Scopus, EBSCO, and Web of Science, aiming to identify relevant articles published in international scientific journals between 1991 and 2023. This effort stemmed from a specific research question: What does the academic literature reveal about the relationship between the use of the ethnographic method in research contexts mediated by the use of information and communication technologies? The searches were conducted in English, using keywords and combinations like ICT, information technology, communication technology, information and communications technology, and ethnography.

Regarding the selection of articles, both inclusion and exclusion criteria were meticulously applied. The inclusion criteria required that the articles be available in full text, published solely in Spanish or English, and specifically focused on the application of the ethnographic method in contexts mediated by ICT. The exclusion criteria aimed to refine the search by focusing on the last three decades. This led to a multi-stage document selection procedure. Initially, the search yielded 304 documents. After reviewing titles, abstracts, and keywords, 29 documents remained. Each remaining article was reviewed to ensure compliance with the established criteria, resulting in the exclusion of non-empirical articles and duplicate documents, finally selecting eleven articles for the systematic review. Table 1 provides a summary of the identified articles:

TABLE I
TEXTS SELECTED FOR THE SYSTEMATIC LITERATURE REVIEW

N	Author	Year
1	M. Sabaté-Dalmau.	2023
2	C. Russo.	2022
3	S.S. Bramo, A. Desta, M. Syedda.	2022
4	V.R. Venumuddala, R. Kamath.	2021
5	S. Qian, P. Yu, A. Bhattacherjee.	2019
6	C. Müller, L. Wan.	2018
7	M. Leslie, E. Paradis.	2018
8	M. Leslie, E. Paradis, M.A. Gropper, S. Kitto, S. Reeves, P. Pronovost.	2017
9	K.P. Sachith, A. Gopal, A. Muir, R.R. Bhavani.	2017
10	N.H. Shidende, F.T. Igira, C.M. Mörtberg.	2017
11	F.N. Kibere.	2016
12	T. Suopajärvi.	2015
13	S. Ackerman, N. Gleason, R. Gonzales.	2015
14	A.W. Kushniruk, E.M. Borycki.	2015
15	L. Ems.	2015
16	N. Walid, E.N.M. Ibrahim, C.S. Ang, N.M. Noor.	2015
17	S. Sayago, P. Forbes, J. Blat.	2013
18	A. Kawlra.	2013
19	M.S. Alam, L. Brooks, N.I. Khan.	2012
20	T. Wang, B. Brown.	2011
21	D. Swinglehurst, T. Greenhalgh, M. Myall, J. Russell.	2010
22	J. Paredes.	2010
23	J. Vieira Da Cunha, A. Carugati.	2009
24	M.J. Chumer.	2009
25	L.D. Browning, J.-O. Sørnes.	2008
26	S. Green, P. Harvey, H. Knox.	2005
27	B. Xiang.	2001
28	C.J.-N. Despres.	1996
29	R. Silverstone, E. Hirsch, D. Morley.	1991

A detailed table is planned for construction to better synthesize the data for this review. It will include information such as publication year, research source, theoretical framework, type of research, instruments used, perspective, studied population, objectives, findings, and the language of publication. This structured approach will facilitate a deeper understanding of the trends, challenges, and opportunities presented by the intersection of ethnography and ICTs in qualitative research.

III. RESULTS

In the digital era, ethnography has significantly evolved with the integration of Information and Communication Technologies (ICT). This section explores how ICT have transformed the collection, analysis, and dissemination of ethnographic data, highlighting both their potential benefits and inherent limitations. In doing so, the uses of ICT are grouped into four fundamental categories crucial for understanding their impact on modern ethnography: Multimodal Data Collection, Data Analysis, Training and

Education, and Accessibility and Community Participation. Each of these categories represents an aspect of how digital technologies can amplify and, at the same time, complicate ethnographic practice.

In addition to detailing the uses and benefits, this text also critically addresses the limitations and challenges that emerge when employing ICT in ethnographic contexts. From issues of privacy and ethics to problems of accessibility and risks of decontextualization, the barriers that can affect the integrity and effectiveness of ethnographic research are examined. Through this analysis, the aim is to provide a balanced view that considers both the transformative advantages of ICT and the obstacles and ethical responsibilities that their use entails in the in-depth exploration of contemporary cultures and societies.

A. Uses

The integration of Information and Communication Technologies (ICT) in modern ethnography has revolutionized both the methodology of data collection and the analysis and dissemination of information. These uses can be grouped into four main categories: Multimodal Data Collection, Data Analysis, Training and Education, and Accessibility and Community Participation.

Multimodal Data Collection. ICT enable ethnographic observation and data collection in diverse formats that go beyond traditional methods. Tools such as video and screenshot capture are used to document real-time interactions, providing a clear and detailed view of everyday practices in settings like hospitals, where interaction with systems such as the Electronic Patient Record (EPR) can be captured [5,13]. Additionally, methods such as interviews, staff narratives, and diversified data collection through digital media (video, audio) facilitate the accumulation of qualitative and quantitative information, making it possible to study complex phenomena in multicultural and multilingual contexts [8,14,15]. These techniques significantly enhance the ability to capture data naturally and less intrusively, accurately reflecting the dynamics of human interactions.

Data Analysis. The use of data analysis tools and specialized software transforms how large volumes of ethnographic data are processed and interpreted. These tools facilitate the identification of patterns and trends, allowing for more efficient qualitative analysis [16]. The UTAUT Model (Unified Theory of Acceptance and Use of Technology) is an example of how structured theories and models can be applied to assess the acceptance and effectiveness of ICT use, providing a robust theoretical framework for understanding the factors influencing technology adoption [17].

Training and Education. ICT also play a crucial role in training and education. Interactive modules and pre-training are essential for preparing users in the effective management of technologies, tailoring content to the specific cultural needs and contexts of users [9,18]. This customization ensures that the material is not only relevant and understandable to users but also reflects their daily realities, thus increasing the effectiveness of educational interventions.

Accessibility and Community Participation. Finally, ICT facilitate greater accessibility and community participation. Digital platforms enable effective communication and collaboration at a distance between research teams and participants, breaking down geographical and cultural barriers [12,20]. In addition, practices such as the subversive access to ICT by marginalized groups, like migrants who circumvent restrictive policies to access technology, are observed. This not only demonstrates the adaptability and resilience of these groups but also highlights the importance of considering the ethical and political dimensions in the use of ICT in social research [21].

Together, these categories demonstrate the depth and versatility with which ICT can be employed in ethnographic research, not only as tools for data collection and analysis but also as facilitators of education and community participation, ensuring that technology plays an emancipating and democratizing role in social research.

B. Benefits

The incorporation of Information and Communication Technologies (ICT) into ethnographic practice has provided multiple benefits that can be classified into three major categories: Improvement in Data Collection and Analysis, Deep Understanding and Contextualization, and Empowerment and Expansion of Reach. Each of these categories encompasses different aspects that transform and enrich ethnographic research.

Improvement in Data Collection and Analysis. ICT have revolutionized the way data are collected and analyzed in ethnographic research. Real-time data collection, using video, screenshot capture, and other digital devices, allows for documenting everyday practices with unprecedented precision [17,21]. This capability to capture the dynamics and flow of interactions in real time results in a significant enrichment of the data corpus available for analysis. Additionally, digital tools for data analysis offer the possibility to manage large volumes of information efficiently, enabling a deeper and more rigorous analysis that reveals complex patterns and underlying trends [6,8,22]. This leads to an improvement in the quality of the collected data, ensuring accuracy and reducing human errors in information processing.

Deep Understanding and Contextualization. The use of ICT in ethnography provides a detailed and contextualized understanding of social and cultural practices. Through the documentation and analysis of artifacts, ICT help to identify incongruities and issues in current practice, offering opportunities to improve the design and implementation of technologies [11]. This detailed approach also facilitates understanding of the cultural and socioeconomic context of specific communities, allowing researchers to tailor their methods and theories to local realities [4,23]. Furthermore, observing multilingual practices and resistance through ICT

reveals how individuals adapt and transform technologies to navigate restrictive or multicultural environments [16].

Empowerment and Expansion of Reach. ICT not only enhance research but also empower the participating communities. By providing vocational education and technology training to remote or marginalized communities, physical barriers are overcome, fostering greater self-empowerment and skill development [15,24]. This empowerment is crucial for cultural, social, and political groups, who use ICT to expand their social networks and access information that is essential for improving their living conditions [1,13]. Additionally, ICT enable an extended reach, facilitating the inclusion of study subjects in remote or hard-to-access areas, resulting in more diverse and representative participation in research.

In summary, the integration of ICT into ethnography has profoundly transformed this discipline, not only by improving the efficiency and quality of data collection and analysis but also by deepening the understanding of the contexts studied and empowering the communities investigated. These benefits highlight the value of modern technologies in exploring and understanding human complexity in the 21st century.

C. Limitations y Disadvantages

The limitations of ethnography with Information and Communication Technologies (ICT) are varied and complex and can be grouped into three main categories: Ethical and Privacy Challenges, Technological and Accessibility Barriers, and Risks of Decontextualization and Technological Dependency. Each category encapsulates critical aspects that can affect the quality and effectiveness of ethnographic research when using technological means.

Ethical and Privacy Challenges. Ethnography with ICT faces significant ethical and privacy challenges. The use of cameras and recording devices, although useful for capturing detailed data, can be perceived as invasive [9], affecting the natural behavior of participants and raising concerns about the confidentiality of the information collected. This impact can alter the authentic interactions that ethnographers seek to observe [21,25]. Additionally, the collection of large volumes of personal data through ICT requires careful management to ensure informed consent and the protection of subjects' privacy, especially in vulnerable populations. These challenges require rigorous consideration of ethical issues to avoid exploitation or inadvertent harm to the communities studied [7].

Technological and Accessibility Barriers. Technological and infrastructure limitations present a significant barrier to the effective implementation of ICT in ethnography. The reliance on technology in research presupposes a robust technological infrastructure, which includes access to the internet and electricity, not always available in remote or low-income areas [3,18,26]. Furthermore, the need to train participants in the use of technologies introduces an additional level of complexity and may require additional resources that are not always available. This aspect is particularly critical in communities with low technological literacy, where interfaces and tools must be intuitive and easily accessible to all users [24,27,28].

Risks of Decontextualization and Technological Dependency. Intensive use of technology in ethnography can lead to disconnection from the natural and cultural context of the subjects studied. Interaction mediated by devices can alter the way people behave and communicate, introducing what is known as the observer effect [18]. This phenomenon can result in data that do not accurately reflect the authentic practices and behaviors of communities. Moreover, reliance on technology can make research vulnerable to technical failures, which can compromise data collection and analysis [16,23]. This highlights the importance of having contingency plans and alternative methods that can adapt to different technological conditions [29].

In summary, while ICT offer powerful tools for data collection and analysis in ethnographic research, these technologies also introduce a range of limitations and challenges that must be carefully managed. Researchers must balance technological innovation with cultural, ethical, and contextual sensitivity to ensure that technology serves as a facilitator, not an obstacle, to understanding the richness of human experiences in their natural contexts.

IV. DISCUSSION AND CONCLUSION

The integration of Information and Communication Technologies (ICT) in contemporary ethnography has sparked a significant transformation in how ethnographic data collection, analysis, and dissemination are conducted. This change, however, comes with complex challenges that deserve a critical analysis concerning the uses, benefits, limitations, and disadvantages of ICT in this field.

ICT have broadened the spectrum of methods available for data collection and analysis in ethnography, ranging from direct observation to community participation through digital platforms [4,17,25]. However, it is crucial to reflect on how each of these uses influences traditional ethnographic methodology. For example, while technologies like video capture and screen recording offer unprecedented visibility into real-time interactions, they also raise questions about the authenticity of the observed behaviors, given that the presence of technology can alter how people act in their natural environment [2,5,29].

The benefits of ICT in ethnography are undeniable, particularly in terms of improvements in data collection and analysis, deep understanding and contextualization, and empowerment and expansion of reach. These technologies not only facilitate more efficient and less intrusive data collection but also enable deeper analysis [18]. Additionally, ICT empower marginalized communities by providing them access to education and means to enhance their technological autonomy. However, it is essential to maintain a critical view of how these benefits are distributed among the studied populations and consider whether the implementation of ICT

truly supports research without introducing new biases or significantly altering the phenomena under study [9].

The limitations associated with the use of ICT in ethnography are profound and multifaceted, encompassing ethical and privacy challenges, technological and accessibility barriers, and risks of decontextualization and technological dependency [11,27]. The potential invasiveness of recording technologies can compromise the privacy of study subjects and alter their natural behavior, challenging the fundamental ethical principles of ethnographic research. Moreover, reliance on robust technological infrastructure is not always feasible in low-resource contexts or remote areas, which can exclude those who do not have access to these technologies. This set of disadvantages underscores the need to critically address the suitability of ICT for ethnographic studies in various cultural and socioeconomic contexts [2,15].

In conclusion, the integration of Information and Communication Technologies (ICT) into ethnography has provided valuable tools that transform data collection, analysis, and dissemination, thereby facilitating a deeper and more accessible understanding of cultures and societies. However, the adoption of these technologies also introduces significant challenges that must not be underestimated [22]. Ethical considerations, technological barriers, and risks of decontextualization are critical aspects that can compromise the quality and authenticity of ethnographic research [13].

From this analysis, several important recommendations emerge for ethnographers who employ ICT in their work. First, it is crucial to implement robust privacy and consent measures to protect research participants, ensuring that their participation does not alter their natural behavior. Second, a conscious effort should be made to ensure that technology does not exclude potential participants due to accessibility barriers, and that the tools and methods employed are appropriate and accessible to all communities involved [24]. Finally, researchers must be critical regarding the impact that technologies may have on the authenticity of the data collected, employing a balanced approach that combines traditional and technological methods to capture the complexity of human experiences authentically and ethically [9].

These recommendations aim to guide the implementation of ICT in ethnography in a way that maximizes its benefits while minimizing its disadvantages, allowing technology to serve as a facilitator in the deep and respectful understanding of cultural and social dynamics in the contemporary world.

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6