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Digital Inclusion of Migrants in Türkiye: Emotional, Linguistic, and Structural Barriers

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Abstract

This study uses a bibliometric review of international research and 27 in-depth interviews to investigate digital disparities among migrant groups in Türkiye. We aim to understand how gender, as well as emotional, linguistic, and structural factors influence digital inclusion. The interviews demonstrate how these problems manifest across Türkiye's varied migrant communities, while the bibliometric analysis identifies global themes such as digital literacy, access, trust, and language barriers. The primary obstacles, which are frequently exacerbated by gender and legal status, are monolingual e-government platforms, low digital trust, and reliance on family for online access. The results show that social and emotional aspects of digital inclusion are involved, requiring institutions to be sensitive, build trust, and ensure linguistic accessibility. The study integrates infrastructure with lived experience-based policies, proposing culturally sensitive, linguistically inclusive, and emotionally sensitive strategies. For other areas with sizable migrant populations, this strategy offers a scalable model.

Keywords

digital inclusion; digital trust and safety; language barriers; migrants and refugees in Türkiye

1. Introduction

In recent years, Türkiye has become one of the leading host countries for migrants and refugees. More than 3.4 million people from different linguistic, national, and socio-economic backgrounds now live in the country (International Organization for Migration, 2024). This demographic shift has raised significant operational and policy concerns across social services, employment, healthcare, and education. With the rapid digitization of public services and social support networks, it is more important than ever to make it easier for migrants to access and utilize these online platforms.

Digital inclusion extends far beyond mere internet connectivity; it involves digital literacy, language skills, cultural adaptation, and building trust in digital environments. Low digital literacy, monolingual e-government platforms, limited access to affordable and reliable internet, and mistrust of public institutions are among the structural and sociocultural obstacles that hinder migrants in Türkiye from effectively using digital technology. When online services are not designed with user experience and cultural diversity in mind, they often fail to serve the very populations they aim to reach.

Most existing research treats digital inclusion and migrant integration as separate issues. However, in Türkiye's context, comprehensive studies integrating bibliometric mapping with field-based qualitative inquiry remain scarce. This study fills that gap in two ways: (a) by conducting a bibliometric review of scholarly works on migration and digital inclusion to find essential themes, trends, and gaps; and (b) by conducting semi-structured interviews with migrants in Türkiye to gain a better understanding of their experiences with digital access, usage, and trust. The study provides practical insights for creating inclusive digital services and informing evidence-based policy decisions by comparing local experiences with global trends.

This research aims to address four main questions: First, it explores the dominant themes in the literature on digital inclusion and migration. Second, it investigates how usability, trust, and language barriers impact migrants in Türkiye. Third, it assesses whether local experiences align with or differ from global trends. Lastly, it looks at how insights gained can inform the development of inclusive policies and services.

2. Literature Review (Conceptual)

2.1. Rethinking the "Digital Native" Assumption

Academic research has extensively discussed the idea of "digital natives." Research by Margaryan et al. (2011), Waycott et al. (2010), and Thompson (2013) challenges the assumption that all young people are naturally skilled with technology. Their findings show that school environments often shape digital tool use more strongly than age. This raises questions about the straightforward distinction between migrants and digital natives made by Prensky (2001). Evans and Robertson's (2020) argument for a more nuanced understanding of technological skills, closely linked to socioeconomic factors influencing digital use, is thus supported by this body of research.

2.2. Structural, Socio-Cultural, and Emotional Barriers to Digital Inclusion

Among marginalized populations, the digital divide extends beyond access. It reflects gaps in digital skills, the extent to which technology is meaningful for everyday life, and structural factors such as economic status, cultural identity, and mental health.

Regarding structural barriers, studies by Guberek et al. (2018) and Bastick and Mallet-Garcia (2022) highlight the difficulties undocumented migrants face in the US. These individuals often rely on digital platforms for essential services, but they are wary of them due to concerns about being monitored. This dangerous dependence leaves them more exposed.

Regarding sociocultural barriers: Parents' lack of digital skills and limited access to technology are two of the many issues low-income Latino families face, and they significantly hinder their children's growth and education. Tripp (2011) and Katz et al. (2017) have researched this topic. Goedhart et al. (2019), in their study of low-income mothers in Amsterdam, emphasize that providing technology alone is insufficient to fully engage everyone. They underline that support networks, such as childcare facilities, language courses, and social services, are necessary to make a meaningful impact.

Regarding emotional barriers, Alencar (2020) notes that mobile technology can both empower refugees and expose them to false information and surveillance. According to Baldassar and Wilding (2020), "digital kinning" refers to the way older migrants use technology to preserve their cultural identities, feel less alone, and uphold cross-border relationships—often with the assistance of younger family members.

2.3. Health, Trust, and Social Networks in Migrant Digital Experiences

Social network strength, trust levels, and health status significantly shape outcomes of digital participation. Addressing health concerns, Kouvonen et al. (2021) found that depression and low self-rated health may limit older migrants' use of digital platforms. For culturally and linguistically diverse groups, who frequently face literacy and language barriers that make accessing digital content challenging, traditional, non-digital health information is still crucial, according to Goodall et al. (2014). Mesch (2012) investigates how various groups interact through digital platforms: Minorities often use them to create professional and social networks absent from their offline lives, whereas majority groups primarily use them to maintain existing ties.

Research indicates that achieving digital inclusion necessitates more than just having the right technology. It needs culturally aware and intersectional strategies that recognize people's experiences (Fung et al., 2025; Kouvonen et al., 2021), health needs, education, trust levels, and social networks. The findings strongly support creating policies and educational programs that go beyond simplistic notions of technology and outdated age-based perspectives. Promoting digital equity that prioritizes user needs, adaptation, empowerment, and support tailored to the diverse circumstances of various populations is urgently needed.

2.4. Global Trends, Urban Inequality, and Relevance to Türkiye

The exclusion of people from digital technology is not limited to remote and rural areas. Urban digital inequality is also influenced by systemic problems such as racial segregation, poverty, and immigration anxieties (Katz & Gonzalez, 2016; Mossberger et al., 2012). Li and Ranieri (2013) show that, in China, differences in parental involvement, educational resources, and self-worth affect children's internet use and widen the gap between urban and rural areas. A perspective on the Covid-19 pandemic is presented in McMullin (2021), who demonstrates how the rapid transition to digital integration services affected asylum seekers in Scotland and Quebec. In general, a lack of support at home, inconsistent internet access, and low digital literacy make it difficult for many people to engage online.

In exploring these issues, the present research also employed various visualization techniques in its bibliometric analysis to gain a deeper understanding of digital exclusion. These methods include text mining and bibliometric tools to generate visual outputs such as co-occurrence networks, factorial maps, thematic maps, word clouds, and trend topics (Aria & Cuccurullo, 2017). The patterns and thematic clusters identified

in the literature through these visual approaches influenced both the conceptual framing and the subsequent qualitative investigation of migrants' digital experiences in Türkiye.

3. Methodology

3.1. Stage I: Bibliometric Review

3.1.1. Data Source and Search Date

On August 16, 2025, all bibliometric data for publications from 2014 to 2025 were obtained from the Web of Science (WoS) Core Collection. WoS was chosen due to its consistent metadata and dependable indexing; however, using a single database might limit coverage of regional or non-English journals. Using the Bibliometrix package and its web interface, Biblioshiny (v5.0.1), the analysis was carried out in R (v4.5.1; see Aria & Cuccurullo, 2017).

3.1.2. Search Strategy and Query String

The WoS topic field (TS), which includes author keywords, abstracts, titles, and keywords+, was utilized for the search. The final Boolean query was: TS = ("digital literacy" OR "digital competence" OR "digital skills" OR "e-literacy" OR "digital inclusion"), AND TS = ("migrants" OR "refugees" OR "immigrants" OR "displaced persons" OR "asylum seekers"), AND TS = ("integration" OR "social integration" OR "adaptation" OR "digital access" OR "barriers to access" OR "trust and safety" OR "digital divide" OR "digital inequality").

The query was designed to capture three overlapping areas: (a) digital skills and inclusion, (b) migrant and refugee populations, and (c) integration and access-related outcomes. Synonyms were added in each area to reflect different terms used across studies. To maximize coverage across studies, the Boolean query included synonyms and plural forms specifically. The search found sixty-three publications. The composition of the dataset was unaffected by the addition of additional filters, such as "open access" and "early access." As a result, the final set displays the unfiltered results of the Boolean query.

3.1.3. Eligibility Criteria

Records were required to (a) be written in English, (b) be peer-reviewed journal articles or review papers, and (c) directly address issues of digital inclusion, literacy, skills, access, or barriers within migrant and refugee contexts. This scope guaranteed conceptual coherence and cross-study comparability of results.

The following exclusion criteria were used: (a) publications not written in English; (b) editorials, commentaries, conference proceedings, and book chapters, which frequently lack thorough peer review; and (c) records addressing digital issues in general populations without specifically mentioning migrants, refugees, or displaced groups. To preserve methodological integrity and focus the dataset on high-quality, thematically related research, these restrictions were implemented.

3.1.4. Screening, Export, and Final Dataset

Only 63 records were returned by the original WoS query. After that, the abstracts and titles were examined to ensure they met the eligibility requirements (see Section 3.1.3). Studies that did not focus specifically on migrants, refugees, or displaced persons in relation to digital inclusion and literacy were excluded from the analysis. WoS's metadata standardization minimized the risk of duplicates, and none were identified during the screening process.

A final dataset comprising 63 peer-reviewed reviews and articles that met all inclusion criteria was compiled. Both descriptive information and comprehensive lists of cited references were included in the bibliographic metadata that was exported from WoS in BibTeX format ("Full Record and Cited References"). To ensure compatibility with bibliometric tools, this format was chosen. Bibliometrix (v5.0.1) and its interface, Biblioshiny (v5.0.1), were then used to analyze the dataset after it had been imported into R (v4.5.1; see Aria & Cuccurullo, 2017). This procedure promoted bibliometric research standards, transparency, and reproducibility.

3.1.5. Data Cleaning and Pre-Processing

The Bibliometrix package (v5.0.1) and its interface, Biblioshiny (v5.0.1), were used to analyze the WoS records after importing them into R (v4.5.1; Aria & Cuccurullo, 2017).

To ensure accuracy and comparability, standard bibliometric procedures were followed during the pre-processing stage. All terms in titles, abstracts, and keywords were standardized, punctuation was removed, and special characters were converted to lowercase.

A custom stopword list excluded uninformative words such as "study," "analysis," and "impact." Spelling and variant harmonization merged different forms of terms—for example, "e-government," "e government," and "egovernment"—and standardized synonyms and hyphenated forms as needed. Similarly, keywords with minor differences, like "ICT" and "information and communication technology," were unified to improve the accuracy of co-occurrence analysis.

Critical distinctions, however, were preserved; for instance, "immigrants" and "migrants" remained separate nodes in both author keywords and visualizations, such as word clouds and co-occurrence maps. For clarity, the word "migrant" is used broadly throughout the text. By removing noise and duplicates in this manner, the reliability of bibliometric mapping was enhanced, allowing for more robust analyses through trend analysis, conceptual mapping, thematic mapping, and co-occurrence networks.

3.1.6. Bibliometric Methods and Settings

The conceptual and structural aspects of the field were analyzed using several bibliometric techniques. First, co-occurrence networks were built by examining author keywords that appeared at least three times. To measure similarity, association-strength normalization was applied, and the Louvain clustering algorithm was used for community detection; afterwards, low-weight edges were removed to enhance clarity.

Additionally, a conceptual (factorial) mapping was conducted by applying multiple correspondence analysis to the keyword co-occurrence matrix to identify the field's primary conceptual axes. Thematic mapping was also conducted, evaluating themes based on their centrality (indicating the level of interaction among themes) and their density (reflecting internal cohesion); only keywords mentioned at least three times were included. Finally, a frequency-based word cloud was created to visually represent the most prominent keywords and highlight their importance within the academic discussion. This section describes the methods and parameter choices; the results are discussed in Section 3.1.7.

3.1.7. Visualization and Reporting

The findings from these methods were presented and reported using a series of visual strategies. Key themes in the field were highlighted by clusters in the co-occurrence network, as shown in Figure 1 in Section 4.

The conceptual structure map, depicted in Figure 2, was created using multiple correspondence analysis. In this map, Dimension 1 contrasted equity and community support with access and inequality, explaining 15.27% of the variance, while Dimension 2 separated communication and work-related topics from family and community networks, accounting for 13.18% of the variation.

Figure 3 displays the thematic map, which categorizes clusters into motor, basic, niche, and emerging or declining themes, illustrating the varying levels of development and relevance across different research areas.

Figure 4 shows a bibliometric word cloud highlighting the most frequently used terms in the field. Building on this, Figure 5 presents trend topics from 2017 to 2025, demonstrating how the Covid-19 pandemic sped up debates on digital inequality and how themes such as refugees, literacy, and gender gained greater prominence. Finally, Figure 6 presents the interview word cloud, derived from qualitative transcripts, which highlights everyday language and lived experiences more strongly than the bibliometric word cloud in Figure 4. Figure 6 is discussed in more detail in the qualitative findings (Section 4.2).

3.1.8. Limitations and Considerations

The cluster structure essentially remained unchanged when the keyword frequency threshold was raised from 2 to 4, suggesting that the primary themes remained stable. There are certain restrictions, though. First, regional, non-English, and gray literature are underrepresented in the Web of Science database, potentially leading to bias. Second, the study's timeframe (2014–2025) may overlook past studies on digital literacy and migrant participation. Lastly, bibliometric approaches might overlook context-specific meanings even though they help map relationships and structures. For example, terms such as "trust" or "integration" can vary across disciplines and cultural settings.

Furthermore, concentrating on author keywords may obscure untagged, hidden themes, such as platform governance or algorithmic discrimination. By incorporating qualitative interviews (Stage II), which aid in situating and validating the bibliometric themes within migrants' actual experiences in Türkiye, these problems were resolved. Notably, the interview guide was developed with input from the bibliometric clusters of trust, language barriers, usability, and access, ensuring that local realities and global scholarly insights were aligned.

3.2. Stage II: Qualitative Interviews

This study examines those who have been forced to flee to Türkiye, including refugees and asylum seekers. Türkiye is one of the world's host countries, hosting more than 3.4 million migrants from diverse linguistic, national, and socioeconomic backgrounds (International Organization for Migration, 2024). The research aims to comprehend how migrants use digital platforms and technologies differently.

Participants who met specific inclusion criteria in line with the study's objectives were invited using a purposive sampling technique (maximum variation). Eligible participants met three criteria: (a) They were at least 18 years of age, (b) held residence in Türkiye for at least one year, and (c) self-identified as migrants or refugees, with or without legal status. To capture diverse perspectives, variation in gender, age, education, occupation, and nationality was sought. This mixed sample enabled the testing of global bibliometric trends within Türkiye's complex national context.

In total, 27 in-depth interviews were conducted with migrants residing in major cities with high migrant populations, such as Istanbul and Kocaeli. The sample size was determined by qualitative sufficiency and thematic saturation, ensuring detailed insights into digital exclusion across labor, healthcare, education, and connectivity. To accommodate participants' mobility and time constraints, most interviews were conducted online via secure video platforms, such as Zoom and WhatsApp. At the same time, a smaller number were held in person. This flexibility promoted participation while upholding ethical standards.

Although the sample is not statistically representative, findings are analytically applicable to similar socio-political settings in other refugee- or migrant-hosting countries. The goal is to explore the lived experiences of digital inequality and interpret them within Türkiye's unique cultural, institutional, and technological environment.

Participant demographics, including age, gender, occupation, nationality, residence, and year of arrival, are provided in the Supplementary File, Table A, to facilitate the interpretation of the qualitative data.

The qualitative component consisted of 27 semi-structured interviews with migrants living in Türkiye. To identify themes and gaps in the literature, bibliometric analysis was employed to develop the interview guide. Key themes from past research influenced the interview design, which focused on several critical areas: low literacy, language barriers, access to ICT, concerns about online privacy and trust, digital literacy, and the cultural relevance of the content.

The interview protocol consisted of open-ended questions addressing topics such as access to and use of digital devices and services, digital skills and self-directed learning, online communication with organizations and personal contacts, the benefits and challenges of digital engagement, and both structural and personal barriers to digital inclusion.

To contextualize responses by age, gender, education, immigration status, and length of stay, a demographic section was also included. Pilot interviews were conducted to refine the language and ensure cultural and linguistic relevance.

Ethical standards—such as informed consent, voluntary participation, and confidentiality—were followed. Approval was obtained from the Social and Human Sciences Ethics Committee at Kocaeli University on June 19, 2025 (E-94094268–050.04–795364).

MAXQDA was used to code, transcribe, and anonymize the data. Recurring themes and patterns were found through systematic coding, and MAXQDA also offered visualization tools, such as the word cloud shown in Figure 6. This method generated evidence-based insights into how digital inequality affects migrant integration, service accessibility, and daily life in Türkiye.

4. Results

4.1. Bibliometric Findings

This bibliometric analysis offers a diagnostic perspective on how studies of migration and digital inequality conceptualize problems similar to those experienced by migrants in Türkiye. Six complementary visualizations are used to present the findings, illustrating temporal, conceptual, and structural dynamics. When taken as a whole, they reinforce the article's qualitative insights and highlight parallels and discrepancies between migrants' everyday lives and global scholarly debates.

Figure 1 shows the co-occurrence map, revealing the core structure of the literature. Key nodes, including the digital divide, migration, the internet, technology, and digital skills, highlight a strong focus on structural barriers to access. The clusters reveal more specific themes: Blue relates to migration, integration, and refugee experiences; red highlights the digital divide, technology, and inclusion; green encompasses digital skills, social media, and socio-demographic differences; and purple reflects digital literacy and learning processes. According to these clusters, digital inclusion is closely related to identity, social adaptation, and other sociocultural elements in addition to technical access. The field's dual nature is reflected in this clustering, where socio-cultural elements (such as language, trust, and gender) emerge as secondary yet related themes, while structural issues (like the digital divide and access) take center stage.

The results of the Turkish interviews align with this framework. Participants discussed the difficulties they faced in navigating culturally unfamiliar systems, as well as connectivity issues. Earlier studies, such as Katz

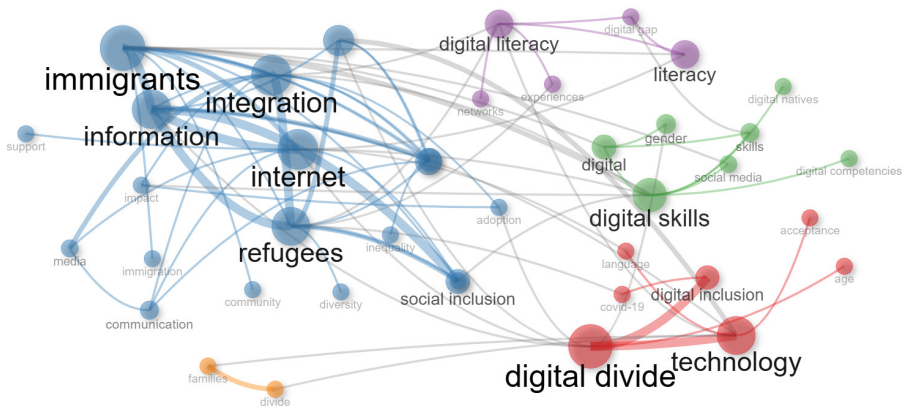

Figure 1. Co-occurrence map.

and Gonzalez (2016) and Guberek et al. (2018), show that digital inequality goes beyond access. It also involves barriers such as bureaucracy, language difficulties, and concerns about safety and trust.

Figure 2 presents the conceptual structure of the literature via a factorial mapping. The primary emphasis on digital inclusion is indicated by the central blue cluster, which connects concepts such as the digital divide, digital literacy, migrants, refugees, integration, inequality, and technology. Two peripheral zones emerge around this core: The green cluster emphasizes digital equity, immigration, families, support networks, and community, highlighting the importance of relational and collective factors in digital inclusion. The red cluster, in contrast, focuses on digital transformation, communication, media, workplace practices, and social integration.

The axes of the map show how academic debates connect experiential and social factors—such as workplace engagement, empowerment, and community support—with structural factors like access, equity, and technological change. Interestingly, the differentiation between central and peripheral themes highlights the importance of an intersectional approach. This result is consistent with qualitative data from Türkiye, where participants stressed that for meaningful digital participation, language accessibility, institutional trust, and cultural familiarity are equally important as internet connectivity.

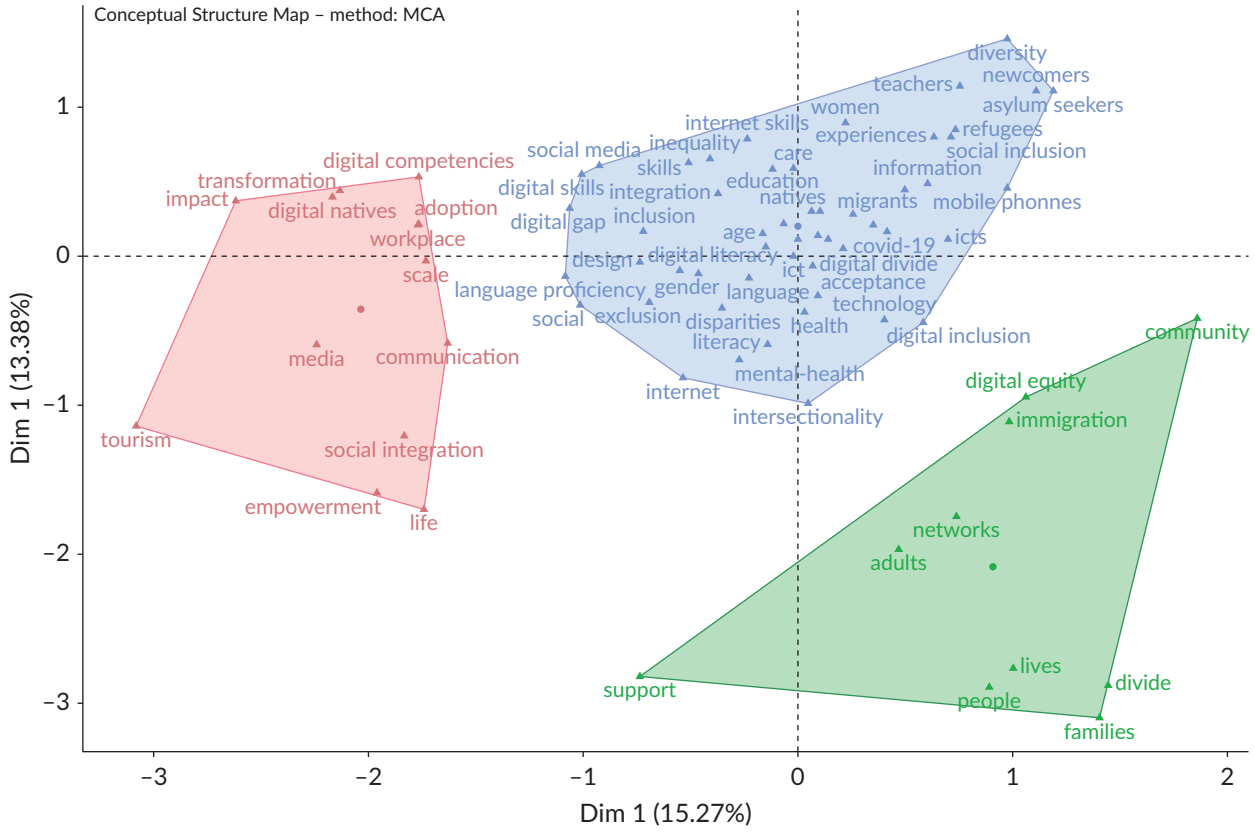

Figure 2. Factorial map.

Figure 3 displays the thematic map, which groups clusters by centrality (relevance) and density (development). The motor themes include the digital divide, the internet, and integration, emphasizing their crucial and well-established roles in the field. The basic themes—such as migration, refugees, refugee

integration, digital literacy, and networks—are highly relevant but still lack comprehensive theoretical development, indicating areas that need further conceptual work. Niche themes, such as exclusion, inclusion, workplace, tourism, and digital natives, represent specialized discussions that are significant yet less connected to the broader field. Examples of new or declining themes that highlight gendered and life-course issues that are either becoming more or less significant include refugee women, internet skills, ICT, women, care, and pregnancy. This classification illustrates the relationship between caregiving responsibilities and digital exclusion, which validates the qualitative findings. Many female participants in Türkiye reported relying on family members for digital mediation.

The thematic map reinforces the study's main point that achieving digital equity involves recognizing interconnected vulnerabilities related to gender, age, and social status (Alencar, 2020; Olsson & Bernhard, 2021). The thematic map confirms the presence of both well-established (motor) themes and emerging, less integrated topics such as refugee women and caregiving roles, which remain peripheral but highlight potential directions for future research.

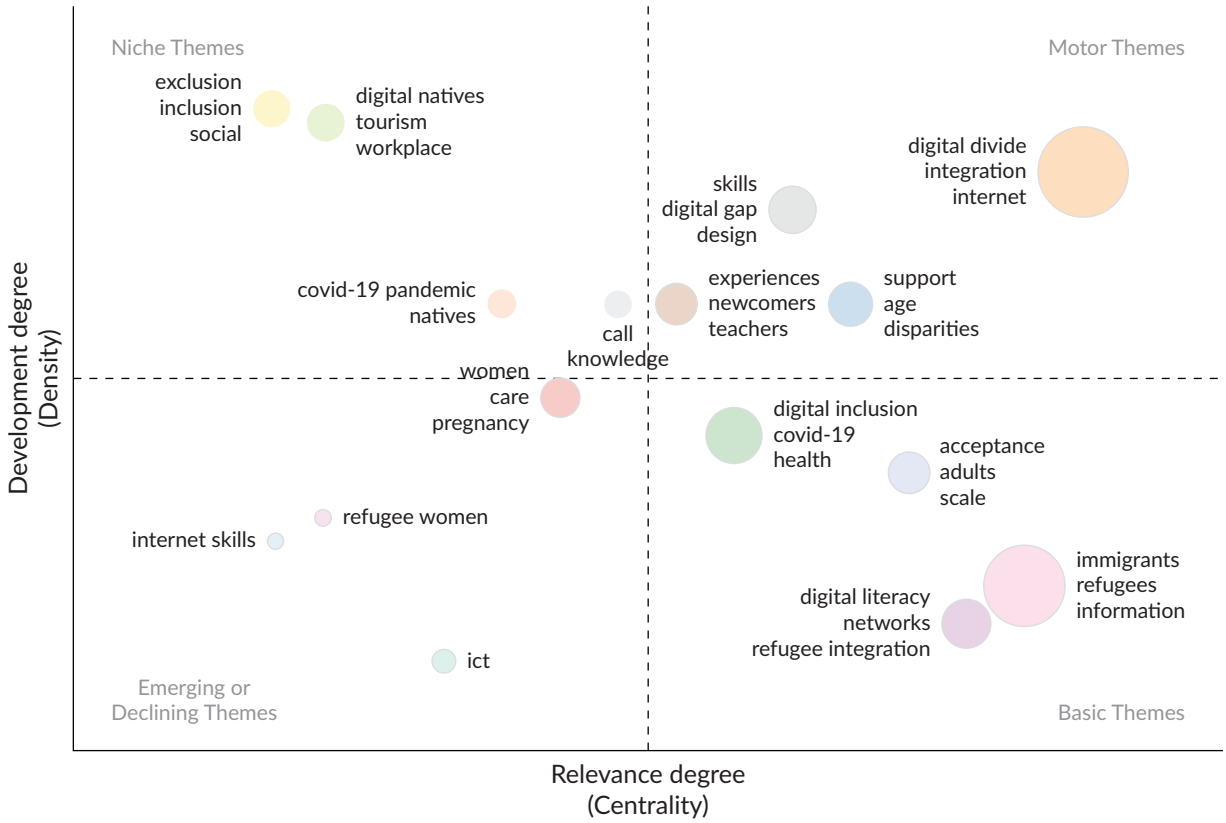

Figure 3. Thematic map.

A word cloud of the most commonly used terms in the literature is shown in Figure 4. Notable ideas that demonstrate their centrality in academic debates include the digital divide, immigration, refugee issues, integration, the internet, technology, digital skills, and digital inclusion. Also prominent are terms such as education, social inclusion, literacy, gender, language, and Covid-19, highlighting the ongoing relevance of socio-cultural and contextual issues. Asylum seekers, families, networks, care, and disparities are some of the less prevalent but equally significant terms that illustrate how structural problems influence identity,

vulnerability, and day-to-day existence. This lexical overview is consistent with both qualitative and bibliometric findings: women reported gender-specific barriers to digital participation, while participants in Türkiye highlighted linguistic difficulties on monolingual e-government platforms. The word cloud supports the idea that digital inclusion policies should go beyond infrastructure to address cultural, linguistic, and gender inequalities.

Figure 4. Word cloud.

The evolution of trend topics from 2017 to 2025 is depicted in Figure 5. Although the dataset spans 2014–2025, trend analysis begins in 2017 because relevant keywords were not used frequently enough before that year. Between 2017 and 2019, debates on migration and access barriers intensified, with a focus on immigration, digital inclusion, internet use, digital skills, and the digital divide. In the period between 2020 and 2021, concerns about digital inequality increased further during the Covid-19 pandemic, bringing migration and the digital divide into sharper focus.

This shift highlights how global crises, such as the Covid-19 pandemic, can drive research in areas like digital disparities in access to public services. As interest in how various groups experience digital inclusion has grown since 2022, new themes such as gender, digital literacy, and refugee experiences have received increased attention. Recent migrants also emphasized the importance of language accessibility, institutional trust, and culturally sensitive digital services, despite significant access barriers remaining. These trends align with the qualitative findings.

When creating Figure 5, trend topic labels were standardized by removing suffixes and unnecessary punctuation (e.g., "digital literacy-" was corrected to "digital literacy"). We also unified spelling variations—for example, "Digital Inclusion" and "digital inclusion" were combined for consistency.

The five visualizations collectively demonstrate the intersection of global academic discussions with the daily digital challenges encountered by migrants in Türkiye. The factorial and co-occurrence maps demonstrate the continued importance of structural barriers—such as those related to access, digital equity, and technological gaps. Thematic and trend analyses highlight understudied issues such as gendered caregiving roles, literacy, and language accessibility, which are gaining importance. By linking structural and sociocultural elements, the word cloud also demonstrates how identity and vulnerability influence digital inclusion.

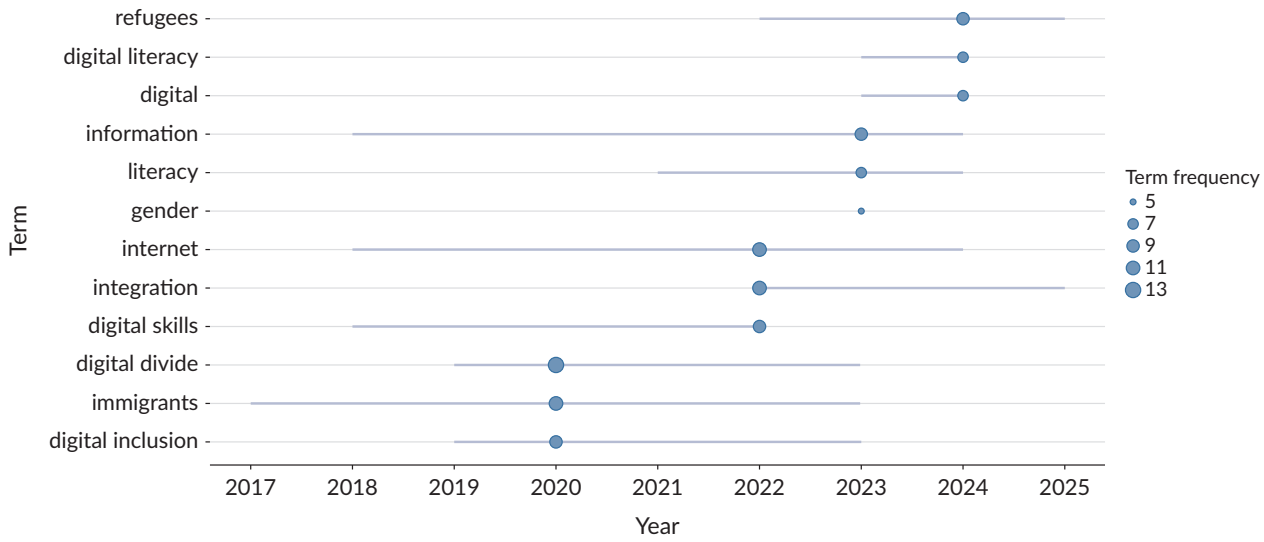

Figure 5. Trend topics over time.

These findings, when paired with qualitative data, suggest that policy initiatives should prioritize cultural adaptation, multilingual accessibility, and trust-building on digital platforms in addition to infrastructure provision. Effective digital inclusion for migrants requires strategies that recognize intersectional vulnerabilities and the socially embedded nature of digital experiences, according to this conclusion, which also supports earlier research (Alencar, 2020; Baldassar & Wilding, 2020; Olsson & Bernhard, 2021). When taken together, the bibliometric evidence (Figures 1–5) supports the study's two-stage design. It supports the qualitative findings and charts the conceptual and structural aspects of digital inclusion.

4.2. Qualitative Findings

The qualitative findings broaden and enhance the bibliometric analysis by providing a foundation for international discussions on migrants lived experiences in Türkiye. Bibliometric mapping (Figures 1–5) highlighted structural and conceptual themes, including language barriers, trust in institutions, digital literacy, and integration. The interviews provided concrete examples of how these issues manifest in everyday life. The coding process identified five themes: digital competency, trust and safety, access and usage, barriers to access, and impact on integration. Refer to Supplementary File, Table B, for the complete coding scheme.

4.2.1. Access and Usage

Many participants reported using digital devices and services daily for communication, education, news, and official transactions. The bibliometric co-occurrence map (Figure 1), which shows "access," "internet," and "communication" as central nodes, is consistent with this pattern. Codes like "frequency of use" and "intended use," which highlight the significant reliance on digital tools, also support this (see Supplementary File, Table B). A 25-year-old male student from Palestine, residing in Kocaeli since 2018, noted:

> I use the internet and digital devices nearly every day—social media, daily news, official transactions, and educational websites. (M1)

A 34-year-old female journalist from Chechnya, living in Konya since 2015, also stressed the importance of digital tools for both professional and personal needs:

> I use it a lot, for social media, news, and work. (M8)

The factorial map (Figure 2) placed "communication" and "education" as key concepts in the field, and the interviews confirm that migrants rely on these functions in daily digital practices. The interview word cloud (Figure 6) shows participants' everyday language, in contrast to the bibliometric word cloud in Figure 4. Frequently mentioned terms include "digital, use, access, communication, internet, services, safe, problems, and language." Personal pronouns, place names (such as Istanbul, Kocaeli, and Türkiye), and words like "family," "student," and "job" also appear frequently, highlighting the experiential and emotional dimensions of digital inclusion. These elements complement the bibliometric findings by grounding global themes in migrants' everyday experiences. For detailed theme definitions and codes used in the analysis, see Supplementary File, Table B.

Figure 6. Interview word cloud.

4.2.2. Barriers to Access

Significant connectivity problems persisted despite high engagement, which corresponds to the thematic map's "barriers" cluster (Figure 3). Approximately 50% of the participants reported experiencing financial difficulties, power outages, or internet connectivity issues. A 20-year-old female student from Bulgaria, living in Istanbul since 2023, explained:

> I can't use the internet because there is no signal in some places. (M4)

A 28-year-old female student from Syria, who has resided in Istanbul since 2020, added:

> I live in a student apartment, so the internet speed is not that good. (M5)

Similarly, a 39-year-old female student from Kyrgyzstan, living in Istanbul since 2013, remarked:

> Depending on the service provider, network breakdowns and power breakdowns. (M12)

These limitations included "internet access problem," "electricity outage," and "financial distress," as listed in the Supplementary File, Table B, under "barriers to access." These obstacles align with global studies on the unequal growth of digital infrastructure and its impact on social inclusion (Alencar, 2020; Ortega, 2017). The results demonstrate that socioeconomic status, housing, and geography—factors that are often overlooked in international bibliometric analyses—have a significant impact on access inequality. However, some participants reported encountering "no barriers at all." Related codes for access barriers are detailed in Supplementary File, Table B.

4.2.3. Trust and Safety

A great deal of attention was given to privacy, surveillance, and data security, which is consistent with the bibliometric focus on trust. Terms like "safe," "feel," "personal," and "data" all relate to this theme in Figure 6. These terms show how migrants often see online engagement as risky and vulnerable, highlighting emotional and technical barriers to participating digitally.

A 34-year-old female housewife from Turkmenistan, living in Izmir since 2018, explained:

> I don't feel comfortable giving my personal information. (M6)

A 34-year-old male overseas export sales manager from Kyrgyzstan, residing in Kocaeli since 2011, stated:

> No site or social site is safe—your account can be hacked, your information shared. (M15)

Similarly, a 35-year-old female journalist from Azerbaijan, who has lived in Istanbul since 2005, remarked:

> Revelations of privacy intrusions make me nervous. (M17)

With codes such as "self-confidence," "anxiety," and "not feeling safe," Table B in the Supplementary File categorizes these issues under the heading of "trust and safety." This is consistent with past research that demonstrates the psychological, emotional, and technical impacts of digital exclusion (Guberek et al., 2018). The qualitative data also shows a strong correlation between migrants' use of digital platforms and their perceptions of risk and vulnerability. See Table B for code definitions under the "trust and safety'' theme.

4.2.4. Impact on Integration

The use of digital tools by participants also reflected bibliometric themes like "integration" and "education." Many said they were crucial for cultural engagement, social adaptation, and language acquisition. Nine participants reported better environmental adaptation, eight reported improvement in language skills, and fourteen reported enhanced communication skills. These effects are evident in participants' accounts:

A 25-year-old male student from Palestine, living in Kocaeli since 2018, explained:

> Technology assisted in adjusting to the new country, keeping up with the news, acquiring Turkish, and communication. (M1)

A 20-year-old female student from Bulgaria, who has resided in Istanbul since 2023, noted:

> Online platforms have helped me a lot in learning and communication. (M4)

Similarly, a 26-year-old male student from Palestine, living in Kocaeli since 2017, stated:

> Language learning programs, job postings, and communication software accelerated my learning. (M13)

With codes like "adaptation to the environment," "developing language skills," and "making daily life easier," Table B in the Supplementary File categorizes this finding under the theme of "impact on integration." Additionally, "integration" is identified as a motor theme with high centrality and density in thematic mapping (Figure 3). This is corroborated by the interviews, which demonstrate the direct role that digital tools play in linguistic, economic, and cultural integration. The theme structure and code list for integration impacts are provided again in Table B.

4.2.5. Digital Competence and Structural Challenges

The majority of participants expressed confidence in their digital abilities, but many expressed anxiety with institutional barriers and system design. This reflects the bibliometric theme of "digital literacy" while adding an important point: competence depends not only on individual ability but also on system usability.

A 33-year-old female beauty expert from Turkmenistan, residing in Kocaeli since 2018, noted:

> My digital skills were okay, but not the system. Many things cannot be done online, and one must make time-consuming face-to-face visits. (M9)

A 28-year-old female journalist from Kazakhstan, living in Istanbul since 2014, added:

> Websites did not have languages other than Turkish initially. (M11)

Similarly, a 26-year-old male student from Palestine, who has lived in Kocaeli since 2017, explained:

> Digital skills were required since I live alone. I struggled initially due to language and not knowing the systems. (M13)

This result is categorized under "digital competence" in Table B in the Supplementary File, which also includes sub-codes for "language deficiency," "system problems," and "lack of information." The word cloud in Figure 6 shows a similar pattern, with frequent mentions of "language" and "problems."

These examples illustrate how weak system reliability and the absence of multilingual design contribute to digital exclusion, regardless of an individual's skills. Additionally, they show how bibliometric concepts of "digital literacy" can exaggerate individual flaws while ignoring more significant systemic issues.

These findings served as the foundation for a deeper investigation into how linguistic, emotional, and structural obstacles interact to influence digital inclusion, which is further explored in Section 5. All things considered, the qualitative results contextualize and validate the bibliometric maps. The interviews demonstrate how these difficulties are felt within Türkiye's migrant communities, even though Section 4.1 focused on global issues of digital access, literacy, trust, and integration. The difference between "access" and "barriers" in the bibliometric maps is reflected in the participants' experiences with connectivity. Their worries about "fear" and "trust" allude to broader anxieties, but the emphasis on "integration" is directly connected to language acquisition and adaptation.

The study also shows that digital inclusion depends not only on infrastructure but also on emotional factors, connecting global debates with local lived realities. Testimonies from migrants confirm that addressing digital inequality requires developing multilingual, culturally aware, and reliable digital platforms, as well as enhancing infrastructure and training.

Together, the qualitative and bibliometric results indicate that factors beyond infrastructure contribute to digital inclusion. Three themes recurred: (a) linguistic accessibility, particularly the difficulty of monolingual e-government platforms; (b) structural access, including affordability and internet connectivity; and (c) emotional trust, including concerns about safety and surveillance. The bibliometric maps present these issues in abstract form, while the interviews reveal their everyday impact on migrants in Türkiye. Together, these findings highlight the need for digital policies that are multilingual, culturally sensitive, and trust-oriented. Operational definitions of "Digital Competence" sub-codes are summarized in Table B in the Supplementary File.

5. Discussion

This study uses a two-stage design that combines bibliometric analysis with in-depth fieldwork to assess digital inequality among migrants. The bibliometric phase constructs a thematic model based on global research, while the qualitative phase tests and applies it through MAXQDA analysis of 27 interviews in Türkiye. This approach is particularly relevant for digital governance, where linking international perspectives with local realities is crucial to inclusive policymaking. Sample characteristics that may shape these findings (e.g., age, gender, length of stay) are summarized in Table A in the Supplementary File, and the whole coding scheme used to derive themes is provided in Table B.

Among the numerous themes that interview analysis empirically supports in the literature are language barriers, worries about safety and trust, usability problems, and emotional exhaustion. The participants' experiences indicate broader concerns that, despite opportunities for inclusion, digital technologies may exacerbate existing disparities in access, literacy, and trust (Katz et al., 2017).

One important finding from both domestic and foreign research is that the complexity of digital systems, especially e-government platforms, may further exclude disadvantaged users. The MAXQDA analysis revealed

that individuals with limited Turkish language skills, digital abilities, or financial means faced challenges with bureaucratic digital interfaces. These local problems are supported by international studies from Katz and Gonzalez (2016) and Bastick and Mallet-Garcia (2022), which emphasize that difficulties with interfaces and learning costs disproportionately affect disadvantaged users.

Both the bibliometric and qualitative phases revealed gendered patterns of exclusion. Olsson and Bernhard (2021) found that Swedish female entrepreneurs experienced stress when managing digital transformation through informal learning. A similar pattern was seen in Türkiye, where many female respondents—mainly housewives or older women—relied on family members for digital tasks. While family members were willing to help, their support was constrained by resource scarcity and prevailing gender norms. These results are consistent with worldwide patterns that indicate social roles and expectations, education, and income all influence online behavior (Paccoud et al., 2021).

Undocumented status made digital use even more difficult, regardless of gender. Similar to findings among undocumented Latino migrants in the US, migrants without legal status demonstrated greater vulnerability and expressed worries about government websites, surveillance, and information access (Bastick & Mallet-Garcia, 2022; Guberek et al., 2018). Despite being aware of the risks, many did not take precautions, reflecting a widespread sense of technological fatalism.

Language exclusion is a common thread across many contexts. Ortega (2017) describes this as "inequitable multilingualism," which is evident among Arab-, Persian-, and Russian-speaking migrants in Türkiye, who frequently identify language as the primary barrier to accessing digital public services. Although some services are becoming more inclusive, Turkish-only content dominance excludes non-Turkish speakers and creates barriers in healthcare, legal proceedings, and employment access.

Digital inequality, as this study and the literature demonstrate, extends beyond mere access to technology. Support networks, family environment, and local infrastructure all play crucial roles in shaping one's life. Katz and Gonzalez (2016) showed how family and community mediation shape the use of digital tools in the US. This was confirmed by interviewees in Türkiye, who mentioned that they frequently used family, ethnic groups, or peer networks to navigate platforms.

This research emphasizes that the process of digital inclusion is both social and technical. The Covid-19 pandemic exacerbated global digital disparities. According to Vergara-Rodríguez et al. (2022), even among professionals with high digital proficiency, the abrupt transition to online systems revealed digital gaps and increased psychological stress. Parents in our sample, particularly those who were less tech-savvy or had no support, also reported feeling exhausted and perplexed when juggling digital health services or remote education.

In conclusion, digital inclusion is intersectional when comparing domestic field observations with international literature. Migrants in Türkiye experience similar types of exclusion as in other high- and middle-income nations, especially those who are undocumented, have low incomes, or are female users. The impact of Türkiye's unique institutional, linguistic, and legal context varies. Policies should prioritize community-based digital literacy programs, culturally sensitive training, multilingual platforms, and accessible interfaces to sustainably reduce structural inequalities. The overlap between Turkish and international findings underscores the need for policies grounded in real-world experiences.

This study also demonstrates the benefits of integrating bibliometric analysis with qualitative verification. While maintaining their local relevance, this approach can help shape international standards for digital inclusion. User experience, emotional security, language accessibility, and trust—all of which are frequently disregarded but are essential for democratic digital participation—must be at the core of any successful strategy.

6. Conclusion

This study examines digital inequality among migrants through a two-stage design that combines bibliometric analysis with in-depth interviews. The bibliometric phase mapped global themes and debates, while the qualitative phase, based on 27 interviews in Türkiye, provided practical insights into how these issues are experienced locally.

The findings show that language barriers, gender roles, undocumented status, and trust in institutions are key factors shaping digital inequality. Although digital technologies can promote inclusion, they may also exacerbate existing disparities when platforms lack cultural sensitivity, are limited to a single language, or involve complex procedures.

The policy implications are obvious. Digital inclusion cannot be ensured solely by infrastructure. Multilingual, user-friendly, culturally aware, and backed by community-based networks are all essential components of successful solutions. This study also demonstrates the importance of integrating qualitative research and bibliometric analysis to connect local realities with global discussions. This two-stage approach should be applied to various migrant groups and contexts in future research. To ensure that migrants are not left behind in the digital transformation, strategies for addressing digital inequality must be both locally grounded and globally informed.

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Conflict of Interests

The authors declare no conflict of interest.

Data Availability

The data supporting this study's findings are available from the corresponding author upon reasonable request. Due to ethical reasons, interview transcripts cannot be shared publicly.

LLMs Disclosure

The authors used LLMs as a proofreading tool while preparing the manuscript. However, all analyses and interpretations are the sole responsibility of the authors.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author.

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